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SUBMITTAL OF FINAL OPERABLE UNIT 3 REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT

06/09/95

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REPORT

Department of Energy
Fernald Environmental Management Project
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JUN 09 1995

DOE-1071-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

SUBMITTAL OF THE FINAL OPERABLE UNIT 3 REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT

The purpose of this letter is to submit the final Operable Unit 3 (OU3) Remedial Design Prioritization and Sequencing Report (PSR) to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA). The U.S. EPA approved the draft PSR on May 10, 1995, with three comments. Similarly, the OEPA submitted eighteen comments on April 17, 1995. Responses to these comments are also enclosed.

The schedule presented in the PSR is based on the assumptions that future funding for the Fernald site will remain at or near Fiscal Year 1995 levels. The Department of Energy, Fernald Area Office (DOE-FN) understands the EPAs concern about the issue raised in the transmittal letter day May 10, 1995, regarding the appearance of extending the estimated 16-year OU3, interim Record of Decision (IROD) schedule to a 30-year PSR schedule based on available funding. The DOE-FN is making every possible attempt to acquire additional funding for OU3 activities to accelerate the PSR schedule. If funding levels change, any resulting schedule updates will be submitted to the regulatory agencies for approval.

If you have any questions, please contact Anand Shah at (513) 648-3146.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Shah

Enclosure: As Stated

Recycled and Recyclable

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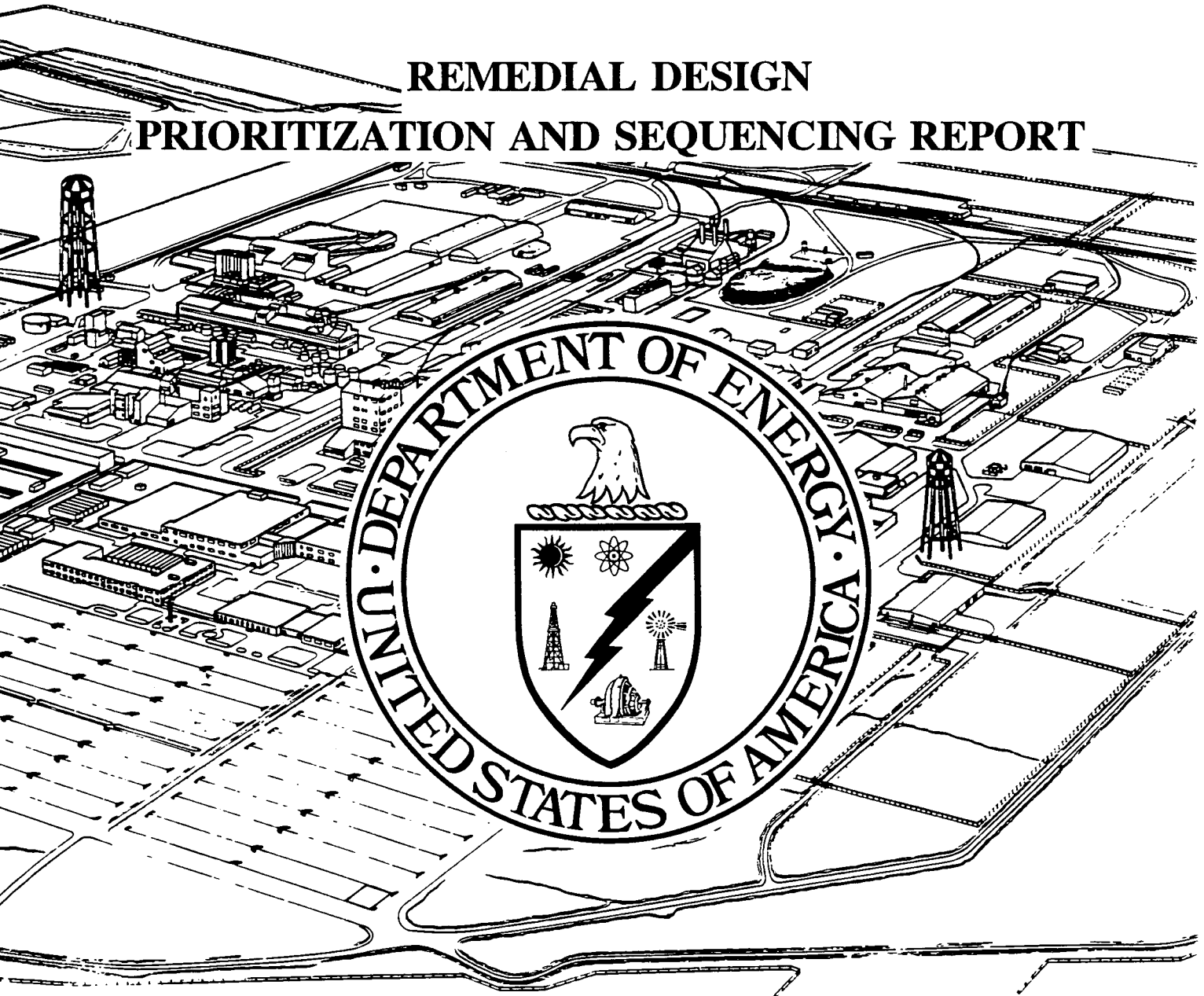
OPERABLE UNIT 3

REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT



JUNE 1995

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

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FINAL

Attachment 1

Responses to USEPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

General Comment

The report describes the scheduling constraints and considerations used in developing the interim remedial action sequence and schedule. However, integrating Operable Unit 3 (OU3) activities with the OU5 schedule for remediation of contaminated soils and groundwater is not discussed in the report. This is an important consideration mentioned in the OU3 Remedial Design/Remedial Action (RD/RA) Work Plan dated March 1995 and should therefore be detailed in this report.

Response to General Comment

It is agreed that the integration of OU3 activities with the OU5 soil remediation schedule is an important consideration for the development of the OU3 base schedule. However, an OU5 schedule for remediation of soils in the former Production Area is not yet available. In lieu of an OU5 schedule, the OU3 base remediation schedule was developed using the most current information available from on-going OU5 RD/RA planning activities. Although a specific OU5 schedule is not discussed in the PSR, the major OU5 activities which require integration have been considered. Section 4.2 describes the three primary drivers considered during the development of the OU3 dismantlement sequence: the proposed On-Property Disposal Facility; the site surface and subsurface hydrology; and the need to remove OU3 structures to allow access for contaminated soil remediation in the former Production Area.

As currently envisioned, soils within the former Production Area will be scheduled for remediation after other FEMP contaminated soils. During the development of the OU3 base remediation schedule, this approach was factored into the scheduling of above-grade dismantlement so that large areas of land will be made available for at- and below-grade remediation projects at a given time.

In the absence of OU5 soil remediation schedules, the pace for structural dismantlement, as discussed in Section 4.2, is currently driven by anticipated funding levels. In the event that the scheduling of OU5 soil remediation impacts the scheduling of dismantling structures under the OU3 interim remedial action, the OU3 base remediation schedule would be appropriately modified.

Responses to USEPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Specific Comment #1

Section 4.1, Page 4-8, Table 4-1. The scheduling constraints and considerations for the Sewage Treatment Plant Complex are discussed in this section. The Sewage Treatment Plant lies in the potential path of the On-Property Disposal Facility; however, the Sewage Treatment Plant is not needed after October 1998 and the complex is not scheduled for remedial action until fiscal year (FY) 2023. The rationale for this schedule should be explained in the report.

Response to Specific Comment #1

Figure 4-1 shows the potentially acceptable region in which the proposed On-Property Disposal Facility can be placed. As the figure shows, a small portion of the Sewage Treatment Plant is in this region. However, the remediation of the Sewage Treatment Plant has not been placed as a high scheduling priority for several reasons.

As stated in Table 4-1, the Sewage Treatment Plant Complex has a high potential for above-grade and below-grade remediation to be integrated with OU5 soil remediation as a single project because some of the components, like the Trickling Filters (25H), are above-grade, but are surrounded by soil berms. Also, the Sewage Treatment Plant Complex is a comparatively small complex, both in construction duration and project cost, and it would be economically more beneficial if both above-grade and below-grade remediation would be combined into an integrated remediation project. This integrated remediation approach would be driven primarily by OU5 soil remediation schedules, assuming available funding.

The base schedule has been developed using the most current information available from on-going OU2 remedial design activities. Until the placement of the On-Property Disposal Facility has been determined, it has been assumed that the Sewage Treatment Plant will not be affected by the construction of the facility, at least in the near term. Cell construction is currently envisioned to be a north to south progression, with southern cell phases coming later to coincide with soil and debris generation.

Also, because the remediation cost for the complex is comparatively small, its remediation may be readily accelerated with little to no impact on the rest of the base schedule. In the event that OU2 remedial design activities determine that the Sewage Treatment Plant

Complex would hinder the construction of the On-Property Disposal Facility, the OU3 base remediation schedule would be appropriately modified.

Specific Comment #2

Section 4.2, Page 4-16, Figure 4-3. The base schedule for the OU3 interim remedial action is presented in this figure. Remedial action construction is postponed until all safe shutdown activities are completed in FY 2001. It may be advisable to begin with remedial action at complexes that are in the potential path of the on-property disposal facility and are available for remediation prior to FY 2001. The Department of Energy should consider changes to the base schedule that will accelerate the interim remedial actions in light of OU5 requirements and other constraints listed in Table 4-1.

Response to Specific Comment #2

As stated above, the base schedule has been developed using the most current information. Although, the on-going OU2 remedial design efforts emphasize optimum geological conditions in siting the On-Property Disposal Facility, implementability is also a consideration, especially in regard to the OU3 base remediation schedule. In the event that the scheduling of remedial action activities for other operable units impacts the scheduling of dismantling structures under the OU3 interim remedial action, the OU3 base remediation schedule would be appropriately modified.

Initial siting concepts indicated the potential for the On-Property Disposal Facility to be constructed over the northwest portion of the former Production Area. At the publication time of the final PSR, that plan was under revision and no significant overlap into the former Production Area was anticipated.

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Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Comment #1

Section 2.3, Page 2-7, Lines 4-14. Line 5 indicates that active and inactive HWMU closures will be accomplished through implementation of response actions under the CERCLA process. Later in this paragraph, closure of active HWMUs are proposed through RCRA processes. Table 3-3 indicates a combination of RCRA/CERCLA integrated processes. Clarification of the responsible regulatory mechanisms should be made.

Response #1

The nineteen inactive HWMUs and seven active HWMUs discussed in this paragraph (and listed in Table 3-3) will be remediated under the OU3 interim action (a CERCLA response action), as discussed in Section 3.6.3.4 of the approved OU3 RD/RA Work Plan. The substantive closure requirements of RCRA will be considered ARARs for this CERCLA response action. The text has been modified for clarification.

Also note that there are eighteen HWMUs to be closed under RCRA per the DF&O currently being negotiated. These eighteen HWMUs are listed and discussed in Section 3.6.3.3 of the OU3 RD/RA Work Plan.

Comment #2

Section 3, General. Three criteria were cited for the assembly of components into complexes for remediation: (1) location and logistics; (2) current and/or future use of the facility; and (3) availability of the components for remediation. Only examples of the component criteria are listed, fuller documentation is not presented. Therefore, no review of the Complex categorization can be made.

Response #2

Understood. The process of assembling OU3 components into remediation complexes took months of iterative discussion using a team of representatives from DOE and various FERMCO departments. Examples were used in the text in order to streamline this discussion. In addition to the examples in Section 3, more detailed, complex-specific documentation has been added to Appendix C.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Comment #3

Section 3.0, Page 3-1, Lines 12-27. This section lists several components that either have been, or are still to be removed under existing removal actions. If the components have already been removed, please include the date, and if they are still to be removed, please list the date removal actions are to begin.

Response #3

The discussion on page 3-1 that lists the removal actions and the associated components that have been removed has been modified to include the dates that the field activities were completed and the dates of the submittals of the removal action close-out reports. The timing for the disposition of non-RCRA drums (G-009), RCRA drums (G-010), inventory (G-011), and mobile containers (G-012) under Removal Nos. 9 and 12 is shown in Appendix A. The following table replaces the removal action list on page 3-1.

OU3 Components Remediated Under Removal Actions

Removal Number	Removal Action Title	Remediated Components	Field Activities Completed	Submittal of Final Report
7	Plant 1 Pad Continuing Release Stage III	TS-001, TS-002, TS-003	7/21/94 (1)	2/19/95
9	Removal of Waste Inventories	G-009, G-010, G-012	Ongoing	
12	Safe Shutdown	G-011	Ongoing	
13	Plant 1 Ore Silos	1C	11/18/94	12/19/95 (2)
15	Scrap Metal Piles			
	Phase I	P-006	9/30/93	10/04/94
	Phase IIB	P-004	Ongoing	
19	Plant 7 Dismantling	4C, 7A, 7C	11/18/94	10/31/95 (2)
28	Contamination at the Fire Training Facility	73A, 73B, 73C, 73D, 73E	5/9/95	7/30/95 (2)

(1) This reflects the date that the dismantlement of the tension support structures was completed, rather than the date that all field activities under Stage III of Removal No. 7 were completed.

(2) These dates reflect anticipated future submittal dates as presented in the respective removal action work plans.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Comment #4

Table 3-1, Page 3-3, Lines 11-25. Please explain why the Pilot Plant Complex is currently unavailable for dismantlement. Table 4-1 indicates that the Pilot Plant Complex could be dismantled once the thorium nitrate inventory was remediated. This should be achievable in the near future, as the thorium nitrate inventory should be remediated shortly after the UNH inventory has been neutralized. Also, prior to recent budget impacts, the Pilot Plant was one of the next two buildings to be dismantled. The Ohio EPA believes that the Pilot Plant should be re-evaluated and given a higher priority for removal.

Response #4

Components within the Pilot Plant Complex were not included in Table 3-1 because of the thorium nitrate inventory. Although it is expected that thorium nitrate treatment will begin in FY-95, this is not the primary issue affecting the decision to place the Pilot Plant Complex in a later part of the optimal remediation sequence.

As discussed in Section 4.1, the development of the dismantlement sequence focused primarily on the need to clear an upgradient area to support OU5 soil remediation and to accommodate the potential On-Property Disposal Facility. The Pilot Plant Complex was not considered a high priority because it does not satisfy either of these drivers. The initial push to remediate it early was based on anticipated availability of funds and the ready availability of most of the Pilot Plant Complex for decontamination and dismantlement. These plans have been altered as a result of budget recisions and re-prioritization of decontamination and dismantlement with regard to other remediation planned for the FEMP.

The proposed sequence of structure dismantlement is based on the assumption that, following removal actions, HWMU closures, and Safe Shutdown activities, the bulk of the threat would be mitigated. The Pilot Plant Complex is identified early in the Safe Shutdown schedule; task orders and work plans are currently being prepared. In the event that the Pilot Plant Complex (or any other complex) would still pose an imminent threat to human health or the environment after completion of these actions, the remediation of complexes would be re-prioritized and the revised base schedule would be submitted to EPA for approval.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Comment #5

Section 3.0, Page 3-5, Line 19. The line states that 23 above-grade complexes were created from OU3 components. However, Table 3-2 and Table 4-1 only identify the same 21 complexes, and the un-numbered Z-folded map includes all of the components listed in Table 3-2 with one additional complex, Grade and Below-Grade Components. Note that in Table 3-3 the At- and Below-Grade is divided into Central, South, and North. This apparent discrepancy requires resolution.

Response #5

Agreed. The reference to 23 complexes on page 3-5 has been corrected to 21 above-grade complexes. For clarification, the title of Table 3-2 has been changed to "Definitions of Above-Grade Complexes." In addition to the 21 above-grade complexes, there is one combined below-grade complex that will be scheduled as part of the OU5 RD/RA process. This below-grade complex was initially divided into three parts (i.e., North, Central, and South) for internal site-wide planning purposes only. Since below-grade remediation will be planned and coordinated during the OU5 RD/RA process and may not be remediated in three parts, all references to dividing below-grade components into distinct projects have been removed from the final PSR.

Comment #6

Table 4-1, Page 4-6. Pilot Plant Complex - Please see Comment #4 above.

Response #6

See the response to Ohio EPA Comment #4.

Comment #7

Table 4-3, Page 4-19. Table 3-1, page 3-3, lists several OU3 components currently available for remediation, yet Table 4-3 shows that no further dismantlement of OU3 components will take place until the year 2000 once Building 4A has been removed, nearly a five-year lull in D&D activities. DOE should include a discussion related to expediting OU3 component removal should additional, unexpected funding be obtained.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Response #7

Agreed. The following paragraph has been added to the Section 5.0 discussion regarding potential schedule updates:

"The most likely cause for a schedule revision would be a change in the projected funding levels used to develop the base schedule. As discussed in Section 4.2, since the budget for the remediation of the FEMP is approved by the U.S. Congress annually and prioritized at the FEMP for optimal risk reduction, the planned funding for decontamination and dismantlement projects in the out-years can only be based on current projections. The base schedule has been developed using these projections, resulting in anticipated annual funding of no more than $10 million throughout the interim remedial action. In the event that additional, unexpected funding for OU3 remediation is obtained, the base schedule will be accelerated accordingly and submitted for regulatory approval."

Comment #8

Section 5.0, Page 5-1, Lines 1-11. The Ohio EPA recommends that the base schedule be updated annually as stated in the approved OU3 RD/RA Work Plan since more definitive budget numbers should be known each year, thus providing the means for a more conclusive base schedule.

Response #8

The annual submittal of a five-year schedule, as discussed in Section 6.1 of the OU3 RD/RA Work Plan, was based on the initial approach that the five-year schedule would be developed using projected budget estimates and that project milestones would, therefore, be negotiated annually. However, in order to provide USEPA and OEPA with milestones for the entire OU3 interim remedial action, the base schedule was not developed for only the first five years. Therefore, the PSR proposes that the base schedule be updated when necessary (rather than annually) and submitted to the regulatory agencies for review and approval.

USEPA responded to this approach with the following: "The RD/RA work plan was reviewed and approved by U.S. EPA knowing that the PSR document would define the schedules for

submittal of implementation plans for the various components in OU3, based on a facility utilization strategy. Once the PSR is approved the associated schedules become final and enforceable under the 1991 Amended Consent Agreement. U.S. DOE is not required to submit an annual PSR." (James A. Saric to Jack R. Craig, "Phase VI Removal Actions," March 8, 1995).

Comment #9

Section A.2.1, Page A-6, Table A.2-1. Reported above-grade unbulked volume estimates for OU3 RD/RA Categories B, H, K, P and Totals do not coincide with the final cumulative generation rates presented in Figures A.2-2, A.2-7, A.2-10, A.2-13, and A.2-14, respectively. The report values are:

Waste Category	*Table A.2-1 (CF)*	*Final Cumulative Generation in Figures (CF)*
B	*1,398,300*	*107,000*
H	*100*	*47*
K	*57,800*	*43,000*
P	*32,200*	*24,000*
Total	*3,903,900*	*2,700,000*

Furthermore, a discrepancy occurs between the reported total volume of OU3 interim remedial action above-grade hazardous and/or mixed wastes between Figure A.2-15 (52,000 CF) and in the text on page A-7, line 13 (81,300 CF).

Response #9

Table A.2-1 lists the unbulked volumes for all OU3 interim action materials, segregated into the seventeen OU3 RD/RA material categories. However, as discussed in Section A.2.1 of the draft PSR, materials generated from the remediation of the Miscellaneous Complex have not been included in the Material Balance Model because the Miscellaneous Complex is expected to be remediated over the course of the OU3 interim action. Since the material generation rates for the Miscellaneous Complex cannot be accurately predicted, none of the Appendix A generation figures included the 1,286,000 cubic feet of unbulked materials

associated with the Miscellaneous Complex. On pages A-7 and A-23, the text states "the exclusion of these materials from the Material Balance Model accounts for the discrepancies between the above-grade volumes shown in Table A.2-1 and the following interim action material generation figures, especially construction debris (Category B), non-process piping (Category K), and regulated/friable ACM (Category P)." Similarly, this also accounts for the discrepancy between the mixed waste estimate stated in the text and Figure A.2-15. To avoid further confusion, the final PSR has incorporated materials associated with the Miscellaneous Complex into the Material Balance Model by assuming a linear generation rate of these materials, starting in FY-01 (to coincide with the start of the External Complex) and ending in FY-25 (to coincide with the completion of the Administration Complex).

Also, it should be noted that Table B-1 in the draft PSR incorrectly listed the bulked volumes, rather than the unbulked volumes, for Process Trailers (G-006) and Non-Process Trailers (G-007). This resulted in a material overestimate of approximately 878,000 cubic feet. This overestimate of material did not affect the interim storage capabilities or the conclusions stated in the PSR. Appendices A and B of the final PSR have been modified to include the appropriate volumes.

As shown in Table B-1, the estimated OU3 quantity of specialty metals (Category H) is 49 cubic feet unbulked, which agrees with Figure A.2-7. Since Table A.2-1 is a summary table, material volume estimates have been rounded. As a result, Table A.2-1 lists the estimated unbulked volume of specialty metals to be 100 cubic feet.

Comment #10

Section A.2.3, Page A-28, Line 23. The statement is made that sludges resulting from the AWWT treatment of perched waters will be dispositioned into the OU5 On-Property Disposal Facility. Please include a statement which says that the sludge must meet the WAC for the disposal cell in order for disposition to occur on-site.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Response #10

Agreed. The text has been changed, as requested, to read: "It is anticipated that the sludges resulting from the AWWT treatment of perched waters will be dispositioned into the On-Property Disposal Facility as they are generated, providing they meet the on-property WAC."

Comment #11

Table A.2-3, Page A-34, Line 16. Removal Action #19, Plant 7 Dismantling - More definitive volume numbers should be available from this removal action since it is nearly, if not already, completed. Please modify this table using the exact volume numbers from Plant 7 if they are currently known.

Response #11

The table on the following page summarizes the material volumes generated during Removal No. 19. As discussed in Appendix A, materials generated/containerized before FY-95 (i.e., before October 1, 1994) are referred to as "existing material" and are included in volume estimates for Removal Nos. 9 and 12. Please note that, as with all volume estimates in Section A.2.3, segregation of materials into FY-94 and FY-95 is based on the date that the material packaging information was entered into the Site-Wide Waste Information, Forecasting, and Tracking System (SWIFTS), not necessarily the actual date of material generation. Updated volumes for Removal No. 19 materials generated/containerized during FY-95 have been included in Table A.2-3 of the final PSR.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Material Volumes Generated During Removal No. 19

OU3 RD/RA Category	Material Type Description	Unbulked Volume (in cubic feet)		
		FY-94	FY-95	Total
B	Construction Debris	2,913	10,681	13,594
D	Transite	767	1,733	2,500
E	Residues, Hold-Up Material, and Sludges	164	7	171
F	Masonry, Concrete, Asphalt	639	560	1,199
H	Specialty Metals	0	27	27
I	Restricted Use Metals	0	5,876	5,876
N	Unrestricted Use Metals	0	2,815	2,815
P	Friable Asbestos	769	103	872
	Total Material Generated	5,252	21,802	27,054

Comment #12

Section A.2.4, Page A-38, Table A.2-4. The total annual generation of other materials is reported to be 80,700 CF, unbulked. However, in Figure A.2-19, this same volume is reported as approximately 807,000 CF, an order of magnitude difference.

Response #12

The annual generation of other materials is 68,100 cubic feet. However, every fourth year the sludge from the Storm Water Retention Basins is dredged, adding another 12,600 cubic feet (totalling 80,700 cubic feet). Table A.2-4 has been modified to give both totals. The bottom graph of Figure A.2-19 reports a cumulative generation of 855,000 cubic feet over twelve years.

Comment #13

Section A.2.5, Page A-38. Figure A.2-20 shows the final anticipated annual and cumulative generation for all FEMP materials. This figure was created through the superposition of several figures, including Figure A.2-14 and A.2-19, which may have discrepancies as noted

above. The validity of the values in Figure A.2-20 should be reexamined in light of these comments. If these model inputs are changed, then a model rerun, complete with updated results and conclusions throughout the rest of the report would be indicated.

Response #13

Agreed. The Material Balance Model has been rerun based on comments received and the updated volume estimates. Appendix A of the final PSR reflects these changes.

Comment #14

Section A.3, Page A-43, Line 22. Material bulking factors were presented in Table A.3-1 without references. Some of the bulking factors seem low. Specifically, the soil bulking factor of 1.00 may be unrealistic.

Response #14

The material bulking factors presented in Table A.3-1 were initially researched during the development of the OU3 Proposed Plan/Environmental Assessment for Interim Remedial Action. The bulking factors were determined using a combination of industry standards, vendor data, engineering judgement, and FEMP waste handling experience. They are currently being refined to support the development of the OU3 RI/FS Report and will be discussed further in that report. For example, the bulking factor for unrestricted use metals (OU3 RD/RA Material Category N) has changed from 23.7 to 16.7 based on data generated during the containerization of structural steel from Plant 7. Similarly, the Material Balance Model will be revised, as necessary, as refined material bulking factors are generated.

As discussed in the first paragraph of Section A.2.1, at- and below-grade materials (e.g., soils) are not included in the Material Balance Model because they will be dispositioned as they are generated and will not require temporary storage. Because of this, the soil bulking factor of 1.00 was included in Table A.3-1 only because it was used in the Material Balance Model as a mathematical place-holder. A soil bulking factor of 1.25 is currently being used for OU5 design efforts and, therefore, has been added to Table A.3-1. However, this change will not affect the results of the Material Balance Model.

Responses to Ohio EPA Comments on the Draft OU3 RD Prioritization and Sequencing Report

Comment #15

Section A.3.3, Page A-47. The cumulative generation and shipment of LLW to NTS is estimated to be 5,200,000 CF (Figure A.3-3). The cumulative volume of generation of all material during the OU3 interim remedial action is estimated at 26,000,000 CF (Figure A.3-5). This more than doubles the OU3 IROD criteria listed on page 2-8, line 28, limiting the volume of off-property disposition to a maximum of ten percent. DOE will need to ensure that the final OU3 ROD addresses this change in off-property disposition percentage.

Response #15

The following paragraph is an excerpt from page 18 of the approved IROD: "To prevent constraints on the decontamination and dismantlement action due to storage space limitations for the resulting construction debris, a limited quantity of wastes would be shipped off-site for disposition. A maximum of 10 percent of all remediation wastes generated by implementing Alternative 3 (42,500 cubic yards as calculated from Table 5-1) would potentially be shipped off-site for disposition and recycling prior to the final disposition decision being determined by the final remedial action ROD for the majority of wastes in OU3. The 10 percent limitation on waste volumes allowed to be dispositioned off-site refers to 10 percent of the total OU3 volume of remediation wastes generated; this was chosen as a limit which would assure that a final disposition decision would not be biased by this action."

Off-site disposition of materials is only limited until the issuance of the final remedial action ROD, not for the entire interim action. In addition, the ten percent restriction is only for OU3 materials remediated under the interim action; Figure A.3-3 represents the off-site disposition of much more than OU3 interim action materials. Based on the draft base schedule presented in Figure 4-3, approximately 115,000 cubic feet (out of a total of 7,092,000 cubic feet) would be remediated before the issuance of the final remedial action ROD, which is only 1.6 percent of the total material to be remediated under the OU3 interim action.

Comment #16

Section A.3.6, Page A-51, Figure A.3-5. The differences between Figure A.3-5 and A.2-20 are unclear in the text.

Response #16

There should not have been any differences between the material generation curves in the two figures. The minor discrepancies between the two generation curves in the draft PSR have been corrected in the final PSR. Figure A.2-20 is used to show the total material generation rate for the FEMP. Figure A.3-5 is used to show the relationship between the shipment rate and the generation rate in the first several years of remediation; this difference is caused by the reduction of existing waste currently in storage.

Comment #17

Figure A.4-1, Page A-54. RA-28 lists soils as being in the uncovered storage category. Contaminated soil piles should be covered with, at a minimum, a tarpaulin or other material in order to prevent runoff.

Response #17

The intent of the uncovered storage category is to consider the use of storage locations that are not structurally covered, such as concrete pads. This was not to imply that soil piles would be exposed to the environment. All bulk storage will be managed under the guidelines established for Removal No. 17 (Improved Storage of Soil and Debris). The reference to "piles" in Figure A.4-1 has been changed to "controlled piles."

Comment #18

Section A.5.1, Page A-61, Line 4. OAC 3754-66 should be changed to OAC 3745-66.

Response #18

Agreed. The text has been changed accordingly.

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OPERABLE UNIT 3

REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

JUNE 1995

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

FINAL

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OPERABLE UNIT 3

REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT

FINAL

JUNE 1995

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Abbreviations, Acronyms, and Initials

ACA	Amended Consent Agreement
ACM	asbestos-containing material(s)
ARAR(s)	Applicable or Relevant and Appropriate Requirement(s)
AWWT	advanced wastewater treatment
BDN	biodenitrification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
DEC	design-engineering-construction
DF&O	Directors Findings and Orders
DOE	United States Department of Energy
DOE-FN	United States Department of Energy - Fernald Field Office
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
FS	feasibility study
FY	fiscal year
HEPA	high-efficiency particulate air
HWMU	Hazardous Waste Management Unit
IROD	Record of Decision for Interim Remedial Action
LLW	low-level (radioactive) waste
N/A	not applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300
NTS	Nevada Test Site
O&M	operations and maintenance
OEPA	Ohio Environmental Protection Agency
OU(s)	operable unit(s)
OU1	Operable Unit 1
OU2	Operable Unit 2
OU3	Operable Unit 3
OU3 PP/EA	OU3 Proposed Plan/Environmental Assessment for Interim Remedial Action
OU4	Operable Unit 4
OU5	Operable Unit 5
PPE	personal protective equipment
PSR	OU3 Remedial Design Prioritization and Sequencing Report
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI	remedial investigation
ROD	record of decision
SWIFTS	Sitewide Waste Information, Forecasting, and Tracking System
SWRB	Storm Water Retention Basins
TSS	tension support structure
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WAC	waste acceptance criteria
WMB	small (white) metal boxes

Units of Measure

cm	centimeter(s)
cm^3	cubic centimeter(s)
cpm	counts per minute
CY	cubic yard(s)
ft	foot (feet)
ft^2	square foot (feet)
gal	gallon(s)
Hr	hour
in.	inch
keV	kilo-electron volt(s)
sec	second(s)

Chemical Symbols

HF	hydrogen fluoride
MgF_2	magnesium fluoride
ThF_4	thorium tetrafluoride
UF_4	uranium tetrafluoride
UNH	uranyl nitrate hexahydrate
UO_3	uranium trioxide

1.0 Introduction

1.1 Purpose and Scope

Section XI.A of the Amended Consent Agreement (ACA) requires that the Remedial Design/Remedial Action (RD/RA) Work Plan "include a schedule for implementation of the RD/RA tasks and submittal of RD/RA reports." The Operable Unit 3 (OU3) Remedial Design Prioritization and Sequencing Report (PSR) is a deliverable to the United States Environmental Protection Agency (USEPA), as specified by the Final OU3 RD/RA Work Plan for Interim Remedial Action (March 1995), to fulfill this ACA requirement. The PSR implements the methodology presented in Section 3.2 of the OU3 RD/RA Work Plan by developing a specific sequence and schedule by which the above-grade portions of all OU3 components will be decontaminated and dismantled. At- and below-grade remediation of OU3 components will be integrated with soil remediation and will be sequenced and scheduled as part of the Operable Unit 5 (OU5) RD/RA process. Additionally, the PSR also satisfies the commitment stipulated by Section IX.F.4 of the ACA by identifying in Section 3 of this report any new and existing buildings and facilities that will be needed during remediation of the Fernald Environmental Management Project (FEMP) and buildings that are no longer needed, while providing for an annual review and update, if necessary. As a result, the requirement to annually review and update this information (previously accomplished through the annual submittal of the Facility Utilization Report to USEPA) will be supplanted by the update and re-submittal of the OU3 interim remedial action schedule to USEPA.

The overall goal of the OU3 interim remedial action is to safely decontaminate and dismantle all OU3 components in a timely, efficient, and cost-effective manner that ensures compliance with all Applicable or Relevant and Appropriate Requirements (ARARs), is protective of human health and the environment, and contributes to the performance of the OU3 final remedial action. In keeping with this goal, this document presents the base schedule for the OU3 interim remedial action, which is founded on a current understanding of future funding trends, coupled with a proposed sequence for the activities. The base schedule will be utilized as a flexible planning tool to manage the in situ surface decontamination and dismantlement of above-grade portions of all OU3 components.

As discussed in Section 3.6.3.1 of the OU3 RD/RA Work Plan, the Ohio Environmental Protection Agency (OEPA) and DOE have developed a Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) integration strategy for hazardous waste management unit (HWMU) closures to be implemented through an OEPA Director's Final Findings and Orders (DF&O). The PSR provides the schedule for documenting and implementing the HWMU closures that will be integrated with OU3 interim remedial action activities.

Another purpose of this document is to evaluate the impact of the remediation schedule on material management. The Material Balance Model, contained in Appendix A, defines the types of materials that will be generated during the OU3 interim remedial action, addresses the rate of generation of those material types, and evaluates the impact of the remedial action schedule on the on-property storage availability.

As discussed in the OU3 RD/RA Work Plan, the base schedule will be reviewed annually. Any resulting schedule updates will be submitted to the regulatory agencies for approval. Also, the Material Balance Model will be revised, as necessary, and submitted to USEPA and OEPA for review and comment.

1.2 Approach

The PSR presents the overall framework that was used to determine the priority and sequence for remediation of OU3 complexes (i.e., groupings of related structures that are further defined and discussed in Section 3.0) and provides the resulting base schedule. The approach used to prioritize and sequence remediation of OU3 components includes a five-step process that incorporates the impacts of several primary factors determined to be integral to the development of the base schedule. Figure 1-1 illustrates that approach in a flow diagram. Sections 3 through 6 of this document discuss each step of the approach. It is anticipated that future schedule updates will use the same approach. Should any future schedule update not reflect the approach described in this document, an amendment to this PSR will be submitted to the regulatory agencies for approval along with the updated schedule.

This document also presents the Material Balance Model that was used to provide an analysis of the capacity for the FEMP to temporarily store material on-property during the OU3 interim remedial action. The model analysis added the estimated volume of material to be generated by the OU3 interim remedial action (using the base schedule presented in Section 4.2) to the estimated volume of material to be generated by other FEMP organizations (over the period covered by the base schedule) to determine total material generation at the FEMP. Current projections for off-property material shipments were then applied to the Material Balance Model to determine availability for temporary storage of materials at the FEMP. The analysis provided by the model becomes integral to the determination of the initial and future updates of base schedules, primarily because one of the limiting factors to performing remediation (i.e., generation of material) is providing sufficient interim storage capacity.

The Material Balance Model uses material disposition assumptions discussed in the OU3 Record of Decision for Interim Remedial Action (IROD), planning documents developed by other FEMP Operable Units (i.e., Draft or Final Feasibility Study Reports or Draft Records of Decision), and the leading remedial alternative for the OU3 final remedial action, which is identified in the OU3 Remedial Investigation/Feasibility Study (RI/FS) Report currently under development. The Material Balance Model also integrates internal schedules for the disposition of containerized materials and wastes resulting from the previous site production mission.

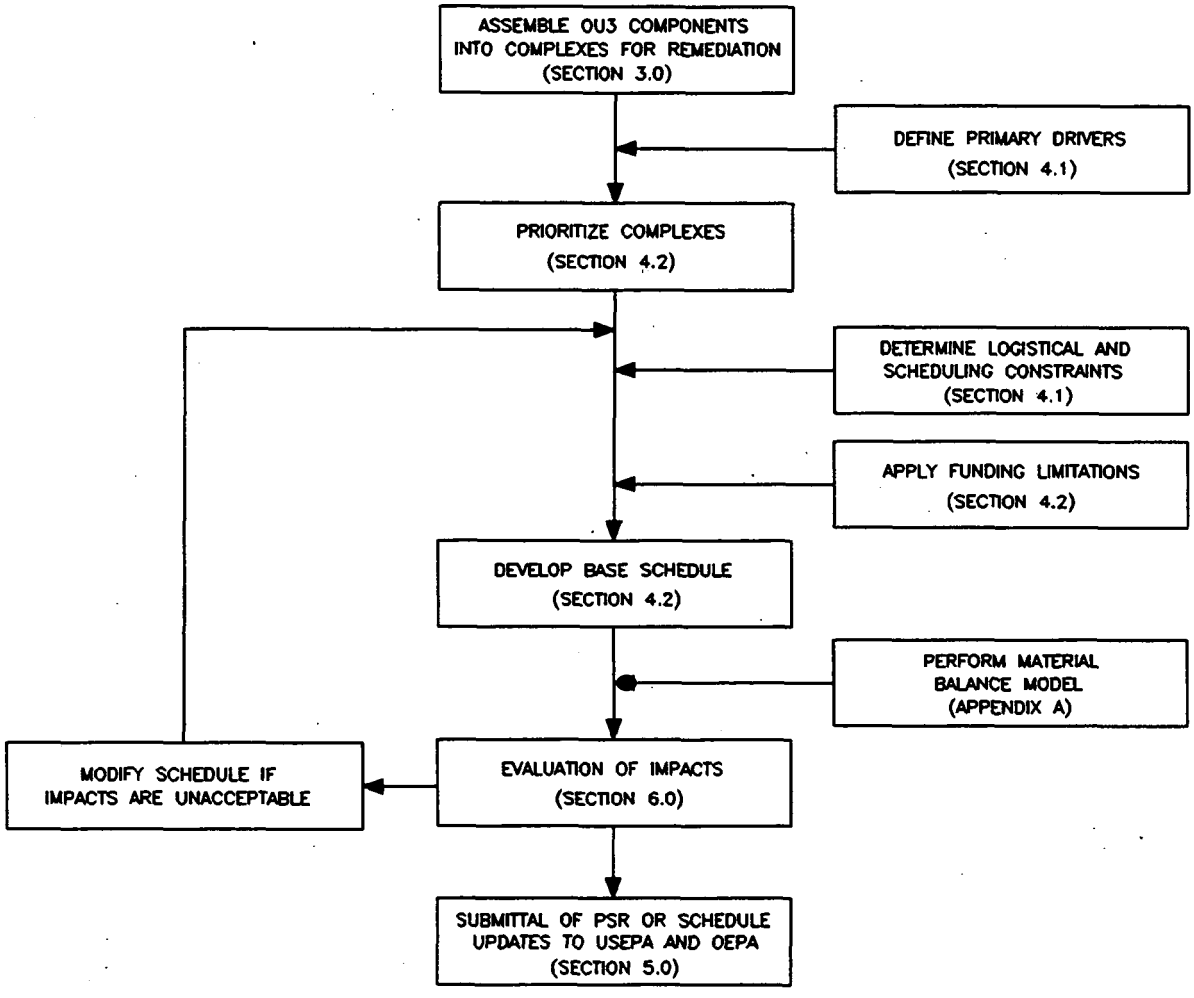

FIGURE 1-1 Prioritization and Sequencing Approach

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2.0 Background

This section provides brief descriptions of the operable units at the FEMP and their preferred remedial alternative and/or selected remedies which factor into the planning of the remediation of OU3 components and will generate materials that need to be included into the Material Balance Model in order to obtain a complete picture of FEMP material storage and disposition needs. Under the ACA, the FEMP has been divided into five operable units, representing a logical grouping of facilities and/or like waste units and/or geographical regions. A more detailed summary of OU3 and FEMP background information is presented in Section 2 of the OU3 RD/RA Work Plan.

A "Comprehensive Sitewide Operable Unit," as defined in the ACA, has been created to evaluate remedies selected for OU1 through OU5 (including remedial and removal actions) to ensure that they are collectively protective of human health and the environment on a sitewide basis, as required by CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and applicable USEPA policy and guidance.

Extensive background information for the FEMP may be found in the Sitewide Characterization Report, the 1993 Annual Site Environmental Report, the OU3 RI/FS Work Plan Addendum, and the OU3 Proposed Plan/Environmental Assessment for Interim Remedial Action (PP/EA), as well as the various CERCLA documents for the operable units.

2.1 Operable Unit 1

Operable Unit 1 (OU1) encompasses six waste pits, the Burn Pit, the Clearwell, water incidental to the waste pit area, and all berms, liners, and soil within the operable unit boundary. This 37.7 acre area west of the former Production Area and south of the main rail spur, combined with the four silos and other Operable Unit 4 facilities, comprises the FEMP waste storage area. The six waste pits, built between 1952 and 1979, contain wastes from past operations at the FEMP. Waste Pits 1-3 are covered with soil. Waste Pit 4 is covered with bentonite clay and a synthetic cover. Waste Pits 5 and 6 are lined with synthetic membranes. The Burn Pit, built in 1957, was used to burn laboratory chemicals and waste oils before it was taken out of service in 1970. The Clearwell was a settling basin for storm water runoff from portions of the waste storage area, including Waste Pits 1-3 and 5.

The selected remedy for OU1 involves excavating the waste pits, treating the waste materials through thermal drying, and disposing of the treated waste at a permitted commercial disposal facility. As a contingency, shipment of any waste that fails to meet the waste acceptance criteria (WAC) of the permitted commercial disposal facility due to radiological concentrations will be shipped to DOE's Nevada Test Site (NTS) for disposal. The amount of waste that may be shipped to NTS will not exceed ten percent of the total waste sludge volume, as discussed in the final OU1 Record of Decision (ROD) submitted to USEPA in January 1995.

The soil caps and liners on the waste pits, and the waste pit contents (sludges), will be removed and treated for off-property disposal. Soil from berms and other areas of the operable unit will be removed and dispositioned in accordance with selected remedies for process area soils as documented in the OU5 ROD (discussed in Section 2.5 of this document).

2.2 Operable Unit 2

Operable Unit 2 (OU2), other waste units, includes the Solid Waste Landfill, the Lime Sludge Ponds, the Active and Inactive Flyash Piles, and the South Field. These subunits also include the berms, liners, and soils within the operable unit boundary. The Solid Waste Landfill, which is located on a three-acre tract at the northeast corner of the waste storage area, was used prior to 1986 for the disposal of cafeteria waste (e.g., food, paper products, styrofoam containers, etc.), rubbish, and other types of waste from non-process areas and site construction activities. The North and South Lime Sludge Ponds are both approximately 150 by 250 feet, and were constructed to serve as settling basins for spent lime sludges from the FEMP wastewater treatment operations, sludges from the neutralization of boiler plant blowdown, and coal pile storm water runoff. The South Lime Sludge Pond has been out of service since 1960. The Active Flyash Pile was the disposal area for flyash from the FEMP boiler plant. The Inactive Flyash Pile was used for the disposal of boiler plant ash, other non-process wastes, and building rubble such as concrete, masonry, steel rebar, gravel, and asphalt. The South Field, located between the Active and Inactive Flyash Piles, was reportedly used as a burial site for FEMP non-process wastes such as flyash, site construction rubble, and soils that may have contained low levels of radioactive contaminants. A slope at the southwest border of the South Field was used as the backstop for the FEMP security firing range for 35 years. Lead ammunition used during target practice is embedded in this slope.

The selected remedy for OU2 involves excavation and on-property disposal of the Flyash Piles, Solid Waste Landfill, Lime Sludge Ponds, and South Field. Soil and debris characterized as clean fill and/or construction rubble will be left in place. Contaminated soil will be removed and dispositioned in accordance with selected remedies for process area soils as documented in the OU5 ROD (discussed in Section 2.5 of this document). Other materials exceeding the on-property WAC will be dispositioned off-property.

2.3 Operable Unit 3

Operable Unit 3 is composed of associated production facilities, support facilities (including all above- and below-grade improvements), equipment, structures, utilities, drums, tanks, solid waste, waste product, thorium, effluent lines, K-65 transfer lines, wastewater treatment facilities, sewage treatment plant, fire training facilities, scrap metal piles, feed stocks, and the coal pile. OU3 does not include the soil and groundwater under the various components, but those resources are potential pathways between sources of contamination within OU3 and receptors. The former Production Area occupies about 136 acres near the center of the FEMP site.

Table 2-1 provides a current list of the 233 components within OU3. The table lists the name of each component and its alpha-numeric designation. This list will be updated during the OU3 interim remedial action if any additional structures are constructed (e.g., temporary storage structures). Additionally, the list will be updated in project-specific remedial action reports as components are removed due to the OU3 interim remedial action or removal actions.

The OEPA and DOE have developed a RCRA/CERCLA integration strategy for HWMU closures to be implemented through a DF&O. As discussed in Section 3.6.3.4 of the OU3 RD/RA Work Plan, the integration strategy focuses on dividing the HWMUs into two categories. The first category contains eighteen HWMUs that are planned to be closed under RCRA prior to

TABLE 2-1 OU3 Component Identification

Component	Component Designation	Component	Component Designation
1. Preparation Plant	1A	45. Plant 8 Railroad Filter Bldg.	8D
2. Plant 1 Storage Shelter	1B	46. Drum Conveyor Shelter	8E
3. Plant 1 Ore Silos (a)	1C	47. Plant 8 Old Drum Washer	8F
4. Ore Refinery Plant	2A	48. Special Products Plant	9A
5. General/Refinery Sump Control Bldg.	2B	49. Plant 9 Sump Treatment Facility	9B
6. Bulk Lime Handling Bldg.	2C	50. Plant 9 Dust Collector	9C
7. Metal Dissolver Bldg.	2D	51. Plant 9 Substation	9D
8. NFS Storage and Pump House	2E	52. Plant 9 Cylinder Shed	9E
9. Cold Side Ore Conveyor	2F	53. Electrostatic Precipitator	9F
10. Hot Side Ore Conveyor	2G	54. Boiler Plant	10A
11. Conveyor Tunnel (from Plant 1)	2H	55. Boiler Plant Maintenance Bldg.	10B
12. Maintenance Bldg.	3A	56. Wet Salt Storage Bin	10C
13. Ozone Bldg.	3B	57. Contaminated Oil/Graphite Burn Pad	10D
14. NAR Control House	3C	58. Utility Heavy Equipment Bldg.	10E
15. NAR Towers	3D	59. Services Bldg.	11
16. Hot Raffinate Bldg.	3E	60. Main Maintenance Bldg.	12A
17. Harshaw Digestion Fume Recovery	3F	61. Cylinder Storage Bldg.	12B
18. Refrigeration Bldg.	3G	62. Lumber Storage Bldg.	12C
19. Refinery Sump	3H	63. Maintenance Bldg. Warehouse	12D
20. Combined Raffinate Tanks	3J	64. Pilot Plant Wet Side	13A
21. Old Cooling Water Tower	3K	65. Pilot Plant Maintenance Bldg.	13B
22. Electrical Power Center Bldg.	3L	66. Sump Pump House	13C
23. Green Salt Plant	4A	67. Pilot Plant Thorium Tank Farm	13D
24. Plant 4 Warehouse	4B	68. Administration Bldg.	14A
25. Plant 4 Maintenance Bldg. (b)	4C	69. Bldg. 14 EOC Generator Set	14B
26. Metals Production Plant	5A	70. Laboratory	15A
27. Plant 5 Ingot Pickling	5B	71. Laboratory Chemical Storage Bldg.	15B
28. Plant 5 Electrical Substation	5C	72. Main Electrical Station	16A
29. West Derby Breakout/Slag Milling	5D	73. Electrical Substation	16B
30. Plant 5 Filter Bldg.	5E	74. Electrical Panels & Transformer	16C
31. Plant 5 Covered Storage Pad	5F	75. Main Electrical Switch House	16D
32. Plant 5 Ingot Storage Shelter	5G	76. Main Electrical Transformers	16E
33. Metals Fabrication Plant	6A	77. Trailer Substation #1	16F
34. Plant 6 Covered Storage Area	6B	78. Trailer Substation #2	16G
35. Plant 6 Electrostatic Precipitator South	6C	79. 10-Plex North Substation	16H
36. Plant 6 Electrostatic Precipitator Central	6D	80. 10-Plex South Substation	16J
37. Plant 6 Electrostatic Precipitator North	6E	81. BDN Surge Lagoon	18A
38. Plant 6 Salt Oil Heat Treat Bldg.	6F	82. General Sump	18B
39. Plant 6 Sump Bldg.	6G	83. Coal Pile Runoff Basin	18C
40. Plant 7 (b)	7A	84. Biodenitrification Towers	18D
41. Plant 7 Overhead Crane (b)	7B	85. Storm Water Retention Basin	18E
42. Recovery Plant	8A	86. Clearwell Pump House	18G
43. Plant 8 Maintenance Bldg.	8B	87. BDN Effluent Treatment Facility	18H
44. Rotary Kiln/Drum Reconditioning	8C	88. Methanol Tank	18J

TABLE 2-1 OU3 Component Identification (Cont'd)

Component	Component Designation	Component	Component Designation
89. Low Nitrate Tank	18K	132. Skeet Range Building	28F
90. High Nitrate Tank	18L	133. Guard Post South of Bldg. 51	28G
91. High Nitrate Storage Tank	18M	134. Chemical Warehouse	30A
92. Dissolved Oxygen Bldg.	18P	135. Drum Storage Warehouse	30B
93. IAWWT Valve House	18Q	136. Old Ten Ton Scale	30C
94. Main Tank Farm	19A	137. Engine House/Garage	31A
95. Pilot Plant Ammonia Tank Farm	19B	138. Old Truck Scale	31B
96. Tank Farm Control House	19C	139. Magnesium Storage Bldg.	32A
97. Old North Tank Farm	19D	140. Bldg. 32 Covered Loading Dock	32B
98. Tank Farm Lime Slitter Bldg.	19E	141. Pilot Plant Annex	37
99. Pump Station & Power Center	20A	142. Propane Storage	38A
100. Water Plant	20B	143. Cylinder Filling Station	38B
101. Cooling Towers	20C	144. Incinerator Bldg.	39A
102. Elevated Potable Storage Tank	20D	145. Waste Oil Decant Shelter	39B
103. Well House #1	20E	146. Incinerator Sprinkler Riser House	39C
104. Well House #2	20F	147. Sewage Treatment Plant Incinerator	39D
105. Well House #3	20G	148. Rust Engineering Bldg.	45A
106. Process Water Storage Tank	20H	149. Utility Shed East of Rust Trailers	45B
107. Gas Meter Bldg.	22A	150. Heavy Equipment Bldg.	46
108. Storm Sewer Lift Station	22B	151. Six to Four Reduction Facility #2	51
109. Truck Scale	22C	152. Health and Safety Bldg.	53A
110. Scale House & Weigh Scale	22D	153. In Vivo Bldg.	53B
111. Utility Trench to Pit Area	22E	154. Six to Four Reduction Facility #1	54A
112. Meteorological Tower	23	155. Pilot Plant Shelter	54B
113. Railroad Scale House	24A	156. Pilot Plant Dissociator Shelter	54C
114. Railroad Engine House	24B	157. Slag Recycling Bldg.	55A
115. Chlorination Bldg.	25A	158. Slag Recycling Pit/Elevator	55B
116. M.H.#175/Eff. Line/Sampling Bldg.	25B	159. CP Storage Warehouse	56A
117. Sewage Lift Station Bldg.	25C	160. Storage Shed (West)	56B
118. U.V. Disinfection Bldg.	25D	161. Storage Shed (East)	56C
119. Digester & Control Bldg.	25E	162. Quonset Hut #1	60
120. Sludge Drying Beds	25F	163. Quonset Hut #2	61
121. Primary Settling Basins	25G	164. Quonset Hut #3	62
122. Trickling Filters	25H	165. KC-2 Warehouse	63
123. 10-Plex Sewage Lift Station	25J	166. Thorium Warehouse	64
124. Pump House-HP Fire Protection	26A	167. (Old) Plant 5 Warehouse	65
125. Elevated Water Storage Tank	26B	168. Drum Reconditioning Bldg.	66
126. Main Electrical Strainer House	26C	169. Plant 1 Thorium Warehouse	67
127. Security Bldg.	28A	170. Pilot Plant Warehouse	68
128. Human Resources Bldg.	28B	171. Decontamination Bldg.	69
129. Guard Post on South End of D St. (c)	28C	172. General In-Process Warehouse	71
130. Guard Post on West End of 2nd St.	28D	173. Drum Storage Bldg.	72
131. Guard Post at T-81	28E	174. Fire Brigade Training Center Bldg. (d)	73A

TABLE 2-1 OU3 Component Identification (Cont'd)

Component	Component Designation	Component	Component Designation
175. Fire Training Pond (d)	73B	205. Receiving/Incoming Materials Inspection	82
176. Fire Training Tank (d)	73C	206. Clearwell Line	88
177. Fire Training Burn Trough (d)	73D	207. Parking Lot	89
178. Confined Space Burn Tank (d)	73E	208. Railroad Tracks	G-01
179. Plant 2 East Pad	74A	209. Roads	G-02
180. Plant 2 West Pad	74B	210. Storm Sewer System	G-03
181. Plant 8 East Pad	74C	211. Utility Lines	G-04
182. Plant 8 West Pad	74D	212. Underground Storage Tanks	G-05
183. Plant 4 Pad	74E	213. Process Trailers	G-06
184. Plant 7 Pad	74F	214. Non-process Trailers	G-07
185. Plant 5 East Pad	74G	215. Pipe Bridges	G-08
186. Plant 5 South Pad	74H	216. Drums (Non-RCRA) (e)	G-09
187. Plant 6 Pads	74J	217. RCRA Drums (e)	G-10
188. Plant 9 Pad	74K	218. Inventory (f)	G-11
189. Bldg. 65 West Pad	74L	219. Mobile Containers (Sea-Land) (e)	G-12
190. Bldg. 64 East Pad & Railroad Dock	74M	220. Soil Piles	G-13
191. Bldg. 12 North Pad	74N	221. Rock Salt Pile	P-01
192. Decontamination Pad	74P	222. Sand Piles	P-02
193. Plant 8 Old Metal Dissolver Pad	74Q	223. Gravel Pile	P-03
194. Plant 8 North Pad	74R	224. Copper Metal Scrap Pile (g)	P-04
195. Bldg. 63 West Pad	74S	225. Coal Pile	P-05
196. Plant 1 Storage Pad	74T	226. Scrap Metal Pile (g)	P-06
197. Pilot Plant Pad	74U	227. Outside Equipment Storage Area	P-07
198. Laboratory Pad	74V	228. Tension Support Structure #1 (h)	TS-01
199. Bldg. 39A Pad	74W	229. Tension Support Structure #2 (h)	TS-02
200. Finished Products Warehouse (4A)	77	230. Tension Support Structure #3 (h)	TS-03
201. D & D Building	78	231. Tension Support Structure #4	TS-04
202. Plant 6 Warehouse	79	232. Tension Support Structure #5	TS-05
203. Plant 8 Warehouse	80	233. Tension Support Structure #6	TS-06
204. Plant 9 Warehouse	81		

(a) removed as part of Removal No. 13 - Plant 1 Ore Silos
(b) removed as part of Removal No. 19 - Plant 7 Dismantling
(c) removed during operation and maintenance activities
(d) removed as part of Removal No. 28 - Contamination of the Fire Training Facility
(e) removed as part of Removal No. 9 - Removal of Waste Inventories
(f) removed as part of Removal No. 12 - Safe Shutdown
(g) removed as part of Removal No. 15 - Scrap Metal Piles
(h) removed as part of Removal No. 7 - Plant 1 Pad Continuing Release

dismantlement of the component containing the HWMU. Closure Plan Information and Data packages will be prepared and implemented for HWMUs contained in this first category.

The second category contains nineteen inactive HWMUs and seven active HWMUs that are planned to be closed through implementation of response actions under the CERCLA process. Activities to decontaminate and dismantle these HWMUs located in OU3 components will be accomplished as part of the OU3 interim remedial action. The substantive closure requirements for the units, including the storage and disposal of the materials/wastes generated, and all necessary verification sampling, will be considered as ARARs for the CERCLA response action. The seven active HWMUs used for storage of hazardous wastes are included in the scope of the OU3 interim remedial action. These HWMUs will continue to be maintained to support the OU3 interim remedial action until they are no longer needed for hazardous or mixed waste storage, at which time they will become available for remediation.

A summary of the OU3 interim remedial action, as described in the OU3 IROD, is presented below.

- Decontamination of structures in OU3 by removing loose contamination. This activity involves in situ gross decontamination of interior and exterior surfaces of above-grade structures prior to dismantlement to reduce direct exposure potential, as well as reduce available sources for airborne or water-borne contamination migration. Methods to be employed depend on the contamination type, level of contamination found, and matrix on which it is found. Additional decontamination procedures would be implemented during dismantlement to remove previously inaccessible contamination.

- Dismantlement of the above-grade structures. Above-grade dismantlement includes the removal of asbestos, electrical equipment, piping, water lines, gas lines, tanks, heating, ventilation and air conditioning ductwork, and electrical lines. The last steps of the dismantling action would depend on the structure but would generally involve the removal of any air filtration apparatus and the removal of the roof, exterior walls, and, finally, any structural members.

- Removal of foundations, storage pads, ponds, basins, underground utilities, and other at- and below-grade structures. Once an acceptable area has been cleared to grade level, at- and below-grade remediation can begin. The at- and below-grade remediation will require coordinated effort to coincide with OU5 remedial actions involving soil excavation and possible groundwater remediation. OU3 and OU5 coordination will allow excavation of environmental media and below-grade structural media simultaneously to avoid double effort and to minimize the potential for additional environmental impacts.

- Use of existing facilities or construction and operation of new interim storage facilities in or near the former Production Area. Existing storage facilities will be used to the maximum extent practical for any necessary storage of materials prior to ultimate disposition. If existing storage space is not available, interim storage facilities may be designed and

constructed in accordance with Removal No. 17 (Improved Storage of Soil and Debris) to store the material generated from the OU3 interim remedial action until treatment and ultimate disposition of the materials can occur. The impacts of the base schedule to the utilization of interim storage is evaluated in Appendix A.

- Off-property disposal at NTS of some non-recoverable and non-recyclable low-level wastes generated by OU3 dismantlement. To prevent constraints on the near-term decontamination and dismantlement action due to storage space limitations for the resulting construction debris, a limited quantity of wastes would be shipped off-property for disposition. A maximum of ten percent of all remediation wastes generated by implementing the interim remedial action would potentially be shipped off-property for disposition and recycling during the period prior to the completion of the OU3 final remedial action ROD. Non-recoverable and non-recyclable low-level wastes destined for off-property disposal would be containerized using strong-tight containers and shipped off-property by truck for disposition at the NTS. The identification of the NTS does not preclude the use of other licensed disposal facilities once applicable requirements for these facilities are met.

- Off-property recycling of some recyclable material from dismantlement. Materials transported off-property will be recycled or reused to the maximum extent practical. Opportunities for employing resource recovery, recycling, and waste minimization will be factored into the planning process for each remedial activity.

- Storage of the remaining material in interim storage facilities or existing facilities until treatment and disposition are selected in the OU3 final remedial action ROD. All materials resulting from the OU3 interim remedial action that cannot be recycled or dispositioned off-property will be stored on-property in interim storage facilities. The material storage and disposition strategies (to be implemented during the period prior to the implementation of the OU3 final remedial action ROD) are described in Section 3.4 of the OU3 RD/RA Work Plan.

As a result of the OU3 interim remedial action to decontaminate and dismantle FEMP structures, the scope for the final remedial action has been reduced to determining the treatment and ultimate disposition for the materials generated by the implementation of the OU3 interim remedial action in accordance with CERCLA.

The OU3 FS is currently being prepared for draft submittal to USEPA and OEPA in September 1995. In the absence of a submitted FS for OU3, the PSR must use realistic assumptions regarding the leading remedial alternative for the OU3 final remedial action in order to adequately evaluate the impacts of the base remediation schedule on the ultimate disposition of OU3 materials since the IROD covers the disposition of only a small portion (i.e., less than ten percent) of OU3 materials. The intent of using these assumptions is not to predispose the treatment and disposition alternatives that may be evaluated in the OU3 FS, but rather to provide initial guidance. In the event that later remedy assumptions for the OU3

final remedial action differ substantially from these assumptions, the impacts to the sequencing and scheduling of building dismantlement, as well as the Material Balance Model, will be evaluated.

The OU3 leading remedial alternative for the final remedial action assumes that the On-Property Disposal Facility will be the selected remedy for OU5 soils. The availability of on-property disposal for OU3 wastes is key to a least cost, low risk OU3 alternative. The leading remedial alternative is reasonable since much of the OU3 wastes will be construction debris of low to moderate contamination, for which the cost of off-property disposal may be prohibitive.

The OU3 leading remedial alternative includes: on-property disposal of contaminated construction materials; off-property disposal of drummed wastes, sludges, product inventory, and process hold-up materials; recycling of readily recyclable materials (primarily valuable metals that can be reused within the DOE complex); and/or decontamination of readily decontaminated materials (structural steel and other valuable non-porous materials) for potential unrestricted release to the commercial sector. Waste treatment would also be considered for certain materials to reduce disposal costs and/or provide for reduced toxicity, mobility, or volume, as necessary.

2.4 Operable Unit 4

Operable Unit 4 (OU4) is a 5.8 acre area located on the western side of the FEMP and is comprised of the following facilities and associated environmental media: Silos 1 and 2 and their contents (also termed K-65 silos); Silo 3 and its contents (termed cold metal oxide silo); Silo 4 (empty); the decant sump (an underground tank and its contents); a radon treatment system; a portion of a concrete pipe trench and other concrete structures; an earthen berm surrounding Silos 1 and 2; soils beneath and immediately surrounding Silos 1, 2, 3, and 4; and perched groundwater in the vicinity of the silos that are encountered during the implementation of remedial actions.

Silos 1 and 2, the K-65 silos, contain residues generated from the processing of high-grade uranium ore. The silos are large, cylindrical, above-grade, concrete vessels with post-tensioned steel reinforcing. The K-65 residues contain large activity concentrations of radionuclides, including radium and thorium. These radionuclides contribute to an elevated direct penetrating radiation field in the vicinity of the silos and to the chronic emission of significant quantities of radon to the atmosphere from the silos. The K-65 residues are classified as by-product materials, consistent with Section 11(e)2 of the Atomic Energy Act, generated consequential to the processing of natural uranium ores.

Silo 3 contains residues, known as cold metal oxides, which were generated at the FEMP site during uranium extraction operations in the 1950s involving the previously mentioned uranium ores and ore concentrates received from a variety of uranium mills in the United States and abroad. Silos 3 and 4 are identical in design and construction to Silos 1 and 2. The residues within Silo 3 are similarly classified as by-product materials pursuant to Section 11(e)2 of the Atomic Energy Act. Silo 4 was never used for waste storage; however, rainwater has infiltrated the silo and was removed in 1989 and again in 1991.

The major components of the selected remedy include: removal of the contents of Silos 1, 2, 3, and the decant sump tank sludge; vitrification (glassification) to stabilize the residues

and sludges removed from the silos and decant sump tank; off-property shipment for disposal at the NTS of the vitrified contents of Silos 1, 2, 3, and the decant sump tank; demolition of the four silos and decontamination, to the extent practicable, of the concrete rubble, piping, and other generated construction debris; removal of the earthen berms and excavation of contaminated soils within the boundary of OU4; placement of clean backfill to original grade following excavation; demolition of the vitrification treatment unit and associated facilities after use; on-property interim storage of excavated contaminated soils and contaminated debris in a manner consistent with the approved Removal Action 17 Work Plan pending final disposition in accordance with the OU5 and OU3 RODs, respectively; and pumping and treatment of any contaminated perched groundwater encountered during remedial activities.

2.5 Operable Unit 5

Operable Unit 5 (OU5), environmental media, includes the groundwater, surface water, soils, sediments, air, vegetation, and wildlife throughout the FEMP and surrounding areas. The groundwater includes the Great Miami Buried Valley Aquifer, a source of water in the vicinity of the FEMP. Surface waters include the Great Miami River, Paddy's Run Creek, and the FEMP's storm sewer outfall ditch. Sediments in the operable unit include solid materials carried in storm water runoff or site effluent discharges to surface waters or drainage ditches. Soils on and off the FEMP property will be investigated for potential contamination due to past discharges or air emissions.

The preferred remedy for OU5 involves excavation and disposal of contaminated soils meeting the on-property WAC in the On-Property Disposal Facility. Soils exceeding the on-property WAC will be disposed off-property. Storm water, groundwater, process and remediation wastewaters, and other waters within the operable unit will be removed and treated for release by the FEMP wastewater treatment system.

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3.0 Assembling Components into Complexes for Remediation

Using the concept of economies of scale, the expenses for a decontamination and dismantlement project can be reduced significantly by addressing multiple components in a single project instead of remediating components as individual projects. The cost and time involved in the development, review, and submittal of contracts, work plans, health and safety plans, etc. are relatively independent of the number and sizes of components within a project. Other expenditures, such as subcontractor training, establishing control zones, mobilization and demobilization of construction equipment and crews, and air monitoring are also relatively independent of the number and sizes of components within a project. Therefore, the above-grade portion of individual components will be combined into groups (called complexes) to reduce remediation costs.

Table 3-1 lists the eighteen components that have been or will be removed under existing removal actions and are therefore not included in the development of the OU3 interim remedial action base schedule.

TABLE 3-1 OU3 Components Remediated Under Removal Actions

Removal Number	Removal Action Title	Remediated Components	Field Activities Completed	Submittal of Final Report
7	Plant 1 Pad Continuing Release Stage III	TS-001, TS-002, TS-003	7/21/94 (1)	2/19/95
9	Removal of Waste Inventories	G-009, G-010, G-012	Ongoing	
12	Safe Shutdown	G-011	Ongoing	
13	Plant 1 Ore Silos	1C	11/18/94	12/19/95 (2)
15	Scrap Metal Piles			
	Phase I	P-006	9/30/93	10/04/94
	Phase IIB	P-004	Ongoing	
19	Plant 7 Dismantling	4C, 7A, 7C	11/18/94	10/31/95 (2)
28	Contamination at the Fire Training Facility	73A, 73B, 73C, 73D, 73E	5/9/95	7/30/95 (2)

(1) This reflects the date that the dismantlement of the tension support structures was completed, rather than the date that all field activities under Stage III of Removal No. 7 were completed.

(2) These dates reflect anticipated future submittal dates as presented in the respective removal action work plans.

Also, the Guard Post on South End of D Street (28C), which was used to store personal protective equipment (PPE) (e.g., smocks and shoe covers) to help protect drivers of delivery trucks from radiological contamination, was removed after roads within the former Production Area were sealed, thereby removing the need for the PPE.

With the exception of several facilities that will be used during the remediation of other operable units, components were combined into complexes that represent the expected scope of engineering design and construction bid packages, as defined by the OU3 RD/RA Work Plan. The process of defining complexes, scheduling the complexes for dismantlement, and evaluating the impacts of that schedule on other FEMP operations is an iterative process. The interdependency of components, especially in terms of the generation and routing of FEMP utilities, has forced the merging of several approaches to defining complexes.

The components were assembled into complexes based on many considerations, such as relative location of components to minimize impacts between dismantlement activities and the daily operations of the site. If possible, complexes were confined to a distinct area, such as a city block, that could be safely partitioned into a construction zone without adversely affecting other projects. Also, this approach greatly reduces the cost of many parts of the project (e.g., supervision, air monitoring, construction support facilities, etc.). Therefore, the nine major processing facilities (i.e., Boiler Plant/Water Plant, Pilot Plant, Plant 1, Plant 2/3, Plant 4, Plant 5, Plant 6, Plant 8, and Plant 9), and the smaller, peripheral structures immediately surrounding those processing facilities, were initially classified as distinct complexes, as discussed in Section 3.2.1 of the OU3 RD/RA Work Plan.

A second consideration for grouping components into complexes was the current and/or future use of the facility. For example, components that support the distribution of electricity across the FEMP were combined into the Electrical Station Complex, although these components are not all located together. Two advantages to grouping components based on their related use are that the components have a high probability of becoming available altogether and are likely to be constructed of the same types of materials, making design and dismantlement activities simpler and, therefore, cheaper.

Whereas the Facility Utilization Report (January 1995) classified existing facilities as "not needed" according to either Phase 1 (facilities to be remediated through either removal actions or the OU3 interim remedial action prior to the OU3 final remedial action ROD) or Phase 2 (facilities for which plans are to wait until after the issuance of the OU3 final remedial action ROD), the PSR evaluates "need" over the entire OU3 interim remedial action, without regard to either timeframe (i.e., Phase 1 or 2). The discussion of scheduling constraints provided in Section 4.1 identifies the results of that evaluation by identifying OU3 components that are needed over the course of the OU3 interim remedial action. Timeframes for facilities that will continue to be utilized are also provided. By defining the period for continued utilization of a facility in the development of an integrated schedule, the base schedule reflects the timing when these facilities are no longer needed. Based on a current evaluation of constraints for all OU3 components, the components listed in Table 3-2 are those which are currently available for remediation (i.e., begin Safe Shutdown).

In addition to the components identified in Section 4.1 as being needed for FEMP remediation, there are five above-grade components that are planned to be used to support OU5 groundwater remediation: High Nitrate Storage Tank (18M); Dissolved Oxygen Building (18P); IAWWT Valve House (18Q); Pilot Plant Ammonia Tank Farm (19B); and the Six to Four Reduction Facility #2 (51), which will be utilized as the new Advanced Wastewater Treatment (AWWT) facility. The scheduling of these five components will not be included in the OU3 interim remedial action base schedule, but will be addressed in OU5 RD/RA submittals.

TABLE 3-2 Components Currently Available for Remediation

Component	Component Designation	Component	Component Designation
Preparation Plant	1A	Skeet Range Building	28F
Ore Refinery Plant	2A	Drum Storage Warehouse	30B
Metal Dissolver Building	2D	Incinerator Building	39A
Cold Side Ore Conveyor	2F	Waste Oil Decant Shelter	39B
Hot Side Ore Conveyor	2G	Incinerator Sprinkler Riser House	39C
Ozone Building	3B	Sewage Treatment Plant Incinerator	39D
NAR Control House	3C	Storage Shed, West	56B
NAR Towers	3D	Storage Shed, East	56C
Hot Raffinate Building	3E	Drum Reconditioning Building	66
Harshaw System	3F	Plant 1 Thorium Warehouse	67
Refrigeration Building	3G	Decontamination Building	69
Combined Raffinate Tanks	3J	Drum Storage Building	72
Green Salt Plant	4A		

The current list of new facilities planned for construction, or those expected to have a construction contract issued, during 1995 include the following:

- AWWT, Phase I & II;
- AWWT, Sludge Dewatering Facility; and
- K-65 Vitrification Facility (Pilot Plant).

New facilities planned for construction beyond 1995 include the following facilities and their respective construction periods:

- OU1 Waste Drying Facility (March 1996 through July 1998); and
- On-Property Disposal Facility (construction of cell berm begins in February 1997; first shipment of material for disposal accepted in August 1997).

The third major consideration that was factored into defining the complexes was the availability of the components for remediation. This was based on the anticipated time when the use of the component would either be eliminated or replaced. This is similar to the grouping of components based on current and/or future use, but allows the combination of two or more unrelated groupings into a complex. For example, the Elevated Potable Storage Tank (20D) was added into the East Warehouse Complex because the components in this

complex would all be available around the same time, albeit for different reasons, and they are located together on the eastern boundary of the former Production Area.

After several iterations of the complex definitions, there were several components that could not be clearly grouped within a complex. Many of these components (e.g., pipe bridges, process trailers, etc.) are supportive of the operations within and around other components and are anticipated to be phased out rather than remediated all at once. Such components comprise the Miscellaneous Complex and will be scheduled as part of other complexes rather than as a distinct remedial activity.

At- and below-grade remedial activities involving OU3 components will be closely integrated with OU5 soil remediation in the former Production Area and Administration Area. Although impacts of at- and below-grade remediation are considered in this document, at- and below-grade remediation is contingent on RD/RA scheduling for OU5 and will be addressed in OU5 RD/RA submittals.

Table 3-3 is an alphabetized listing of the twenty-one above-grade complexes and the components contained within them. These complexes are shown in Figure 3-1 (the Z-folded map at the end of Section 3.0). Also, individual maps of the above-grade complexes are contained in Appendix C.

As discussed in Section 2.3, the remediation of nineteen inactive HWMUs and seven active HWMUs will be integrated into the OU3 interim remedial action. Table 3-4 provides a listing of these HWMUs and their associated component and complex.

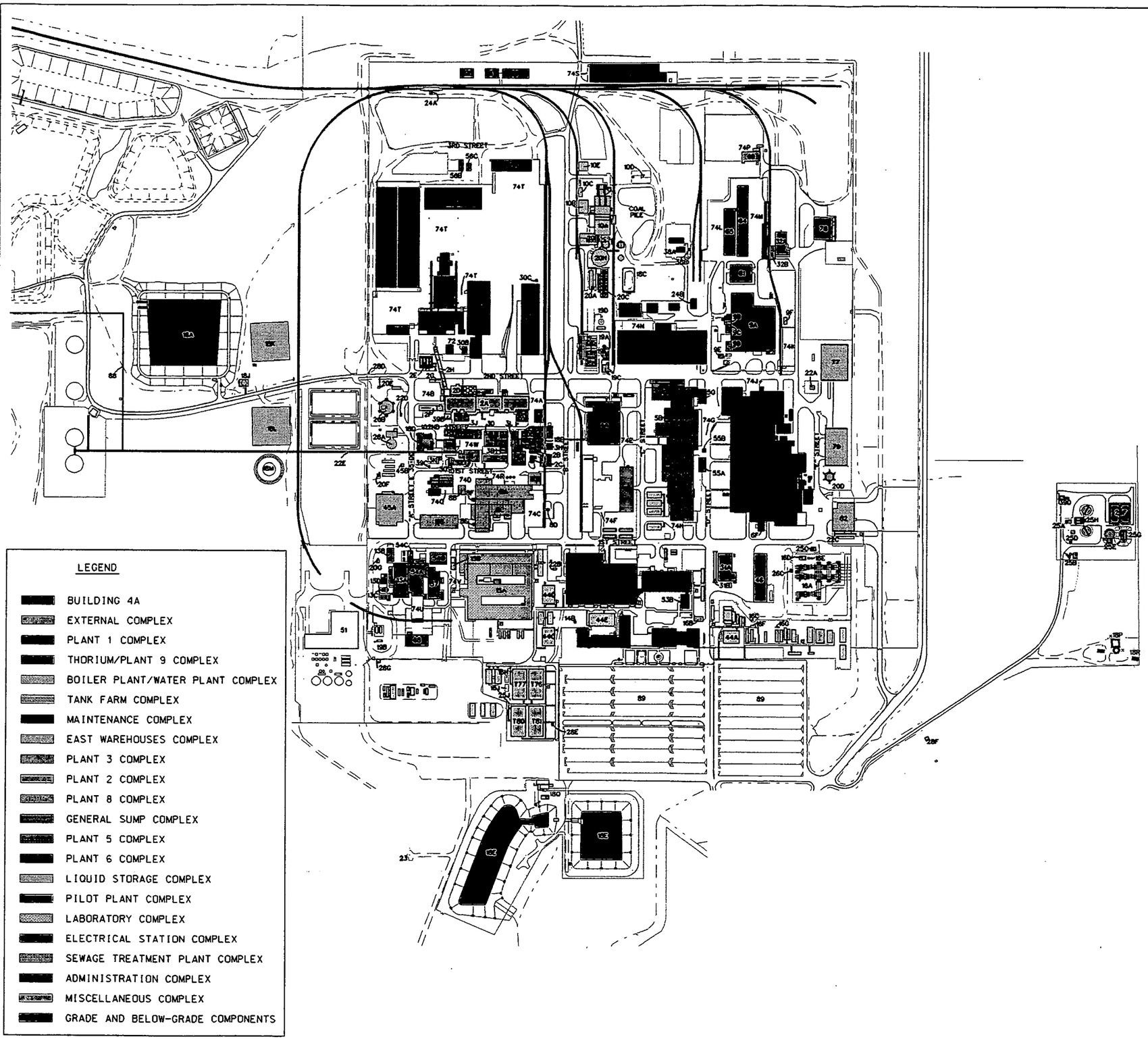
TABLE 3-3 Definitions of Above-Grade Complexes

Complex	Components
Administration Complex	11, 14A, 14B, 28A, 28B, 53A, 53B
Boiler Plant/Water Plant Complex	10A, 10B, 10C, 10E, 20A, 20B, 20C, 20H, 24A, P-005
Building 4A	4A
East Warehouses Complex	20D, 77, 79, 82
Electrical Station Complex	16A, 16B, 16C, 16D, 16E, 16F, 16G, 26C, 31A, 46
External Complex	28F, 39D, 69
General Sump Complex	2B, 2C, 3A, 3H, 3L, 18B, 18D, 18H
Laboratory Complex	15A, 15B
Liquid Storage Complex	18J, 18K, 18L, 20E, 20F, 20G, 22A, 22B, 22D, 26A, 26B, 45A, 45B
Maintenance Complex	12A, 12B, 12C, 12D, 24B, 38A, 38B
Miscellaneous Complex*	16H, 16J, 18G, 23, 25J, 28C, 28D, 28E, 28G, G-004, G-006, G-007, G-008
Pilot Plant Complex	13A, 13B, 13C, 13D, 37, 54A, 54B, 54C, 68
Plant 1 Complex	1A, 1B, 30A, 30B, 56A, 56B, 56C, 60, 61, 62, 63, 66, 67, 71, 72, TS-004 through TS-006
Plant 2 Complex	2A, 2D, 2E, 2F, 2G, 39B
Plant 3 Complex	3B, 3C, 3D, 3E, 3F, 3G, 3J, 3K, 39A, 39C
Plant 5 Complex	4B, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 55A, 55B
Plant 6 Complex	6A, 6B, 6C, 6D, 6E, 6F, 6G
Plant 8 Complex	8A, 8B, 8C, 8D, 8E, 8F, 80
Sewage Treatment Plant Complex	25A, 25B, 25C, 25D, 25E
Tank Farm Complex	19A, 19C, 19D, 19E
Thorium/Plant 9 Complex	9A, 9B, 9C, 9D, 9E, 9F, 32A, 32B, 64, 65, 78, 81

* These structures (e.g., pipe bridges, process and non-process trailers, security shacks, etc.) will be dismantled throughout the remedial action on an "as-available" basis and will, therefore, not be scheduled.

TABLE 3-4 Operable Unit 3 Hazardous Waste Management Unit Closure Status

HWMU Number	HWMU Identification	Component Number	Complex
	INACTIVE HWMUS TO BE REMEDIATED UNDER CERCLA		
1	Fire Training Facility	73A,B,C,D,E	Integrated with Removal No. 28
10	NAR System Components	2A	Plant 2 Complex
11	Tank Farm Sump	19D	At- and Below-Grade
12	Wheelabrator	66	Plant 1 Complex
14	Box Furnace	8A	Plant 8 Complex
15	Oxidation Furnace #1	8A	Plant 8 Complex
16	Primary Calciner	8A	Plant 8 Complex
17	Plant 8 East Pad	74C	At- and Below-Grade
18	Plant 8 West Pad	74D	At- and Below-Grade
22	Abandoned Sump	13A	At- and Below-Grade
25	Plant 1 Storage Building	67	Plant 1 Complex
28	Trane Incinerator	39A 39B 74W	Plant 3 Complex Plant 2 Complex At- and Below-Grade
40	Biodenitrification Surge Lagoon	18A	At- and Below-Grade
41	Sludge Drying Beds	25F	At- and Below-Grade
46	UNH Tanks - NFS Storage Area	2E	Plant 2 Complex
47	UNH Tanks - North of Plant 2A	2A	Plant 2 Complex
48	UNH Tanks - Southeast of Plant 2A	18B	General Sump Complex
49	UNH Tanks - Digestion Area (2 locations)	2A	Plant 2 Complex
50	UNH Tanks - Raffinate Building (2 locations)	3E	Plant 3 Complex
	ACTIVE HWMUS TO BE REMEDIATED UNDER CERCLA		
19	CP Storage Warehouse (Butler Building)	56A	Plant 1 Complex
20	Plant 1 Storage Pad	74T	At- and Below-Grade
29	Plant 8 Warehouse	80	Plant 8 Complex
33	Pilot Plant Warehouse	68	Pilot Plant Complex
34	KC-2 Warehouse	63	Plant 1 Complex
35	Plant 9 Warehouse	81	Thorium/Plant 9 Complex
37	Plant 6 Warehouse	79	East Warehouse Complex



FEMP SITE IDENTIFICATION

TS-4	TENSION SUPPORT STRUCTURE #4
TS-5	TENSION SUPPORT STRUCTURE #5
TS-6	TENSION SUPPORT STRUCTURE #6
1A	PREPARATION PLANT
1B	PLANT 1 STORAGE BLDG.
1C	PLANT 1 ORE SILOS (REMOVED)
2A	ORE REFINERY PLANT
2B	GENERAL/REFINERY SUMP CONTROL BLDG.
2C	BULK LIME HANDLING BLDG.
2D	METAL DISSOLVER BLDG.
2E	NFS STORAGE & PUMP HOUSE
2F	COLD SIDE ORE CONVEYOR
2G	HOT SIDE ORE CONVEYOR
2H	CONVEYOR TUNNEL (FROM PLANT 1)
3A	MAINTENANCE BLDG.
3B	OZONE BLDG.
3C	NAR CONTROL HOUSE
3D	NAR TOWERS
3E	HOT RAFFINATE BLDG.
3F	HARSHAW SYSTEM
3G	REFRIGERATION BLDG.
3H	REFINERY SUMP
3J	COMBINED RAFFINATE TANKS
3K	OLD COOLING WATER TOWER
3L	ELECTRICAL POWER CENTER BLDG.
4A	GREEN SALT PLANT
4B	PLANT 4 WAREHOUSE
4C	PLANT 4 MAINTENANCE BLDG. (REMOVED)
5A	METALS PRODUCTION PLANT
5B	PLANT 5 INGOT PICKLING
5C	PLANT 5 ELECTRICAL SUBSTATION
5D	WEST DERBY BREAKOUT/SLAG MILLING
5E	PLANT 5 FILTER BLDG.
5F	PLANT 5 COVERED STORAGE PAD
5G	PLANT 5 INGOT STORAGE SHELTER
6A	METALS FABRICATION PLANT
6B	PLANT 6 COVERED STORAGE AREA
6C	PLANT 6 ELECTROSTATIC PRECIPITATOR (SOUTH)
6D	PLANT 6 ELECTROSTATIC PRECIPITATOR (CENTRAL)
6E	PLANT 6 ELECTROSTATIC PRECIPITATOR (NORTH)
6F	PLANT 6 SALT OIL HEAT TREAT BLDG.
6G	PLANT 6 SUMP BLDG.
7A	PLANT 7 (REMOVED)
7B	PLANT 7 OVERHEAD CRANE (REMOVED)
8A	RECOVERY PLANT
8B	PLANT 8 MAINTENANCE BLDG.
8C	ROTARY KILN/DRUM RECONDITIONING
8D	PLANT 8 RAILROAD FILTER BLDG.
8E	DRUM CONVEYOR SHELTER
8F	PLANT 8 OLD DRUM WASHER
9A	SPECIAL PRODUCTS PLANT
9B	PLANT 9 SUMP TREATMENT FACILITY
9C	PLANT 9 DUST COLLECTOR
9D	PLANT 9 SUBSTATION
9E	PLANT 9 CYLINDER SHED
9F	PLANT 9 ELECTROSTATIC PRECIPITATOR
10A	BOILER PLANT
10B	BOILER PLANT MAINTENANCE BLDG.
10C	WET SALT STORAGE BIN
10D	CONTAMINATED OIL/GRAPHITE BURN PAD
10E	UTILITIES HEAVY EQUIP. BLDG.
11	SERVICE BLDG.
12A	MAIN MAINTENANCE BLDG.
12B	CYLINDER STORAGE BLDG.
12C	LUMBER STORAGE BLDG.
12D	MAINTENANCE BLDG. WAREHOUSE
13A	PILOT PLANT WET SIDE
13B	PILOT PLANT MAINTENANCE BLDG.
13C	SUMP PUMP HOUSE
13D	PILOT PLANT THORIUM TANK FARM
14A	ADMINISTRATION BLDG.
14B	BLDG. 14 EOC GENERATOR SET
15A	LABORATORY
15B	LABORATORY CHEMICAL STORAGE BLDG.
16A	MAIN ELECTRICAL STATION
16B	ELECTRICAL SUBSTATION
16C	ELECTRICAL PANELS & TRANSFORMER
16D	MAIN ELECTRICAL SWITCH HOUSE
16E	MAIN ELECTRICAL TRANSFORMERS
16F	TRAILER SUBSTATION #1
16G	TRAILER SUBSTATION #2
16H	10 PLEXS NORTH SUBSTATION
16J	10 PLEXS SOUTH SUBSTATION
18A	BDN SURGE LAGOON
18B	GENERAL SUMP
18C	COAL PILE RUNOFF BASIN
18D	BIODENITRIFICATION TOWERS
18E	STORM WATER RETENTION BASINS
18F	PIT #5 SLUICE GATE
18G	CLEARWELL PUMP HOUSE
18H	BDN EFFLUENT TREATMENT FACILITY
18J	METHANOL TANK
18K	LOW NITRATE TANK
18L	HIGH NITRATE TANK
18M	HIGH NITRATE STORAGE TANK
18N	WASTE PIT AREA STORM WATER RUNOFF CONTROL
18P	DISSOLVED OXYGEN BLDG.
18Q	SOUTH PLUME INTERIM TREATMENT BLDG.
18R	OUTFALL LINE PIT
18S	RECOVERY WELL SYSTEM CONTROL BLDG.
19A	MAIN TANK FARM
19B	PILOT PLANT AMMONIA TANK FARM
19C	TANK FARM CONTROL HOUSE
19D	OLD NORTH TANK FARM
19E	TANK FARM LIME SLITTER BLDG.
20A	PUMP STATION & POWER CENTER
20B	WATER PLANT
20C	COOLING TOWERS
20D	ELEVATED POTABLE STORAGE TANK
20E	WELL HOUSE #1
20F	WELL HOUSE #2
20G	WELL HOUSE #3
20H	PROCESS WATER STORAGE TANK
20J	LIME SLURRY PITS
22A	GAS METER BLDG.
22B	STORM SEWER LIFT STATION
22C	TRUCK SCALE
22D	SCALE HOUSE & WEIGH SCALE
22E	UTILITY TRENCH TO PIT AREA
23	METEOROLOGICAL TOWER
24A	RAILROAD SCALE HOUSE
24B	RAILROAD ENGINE HOUSE
25A	CHLORINATION BLDG.
25B	M.H. #175/EFF. LINE/SAMPLING BLDG.
25C	SEWAGE LIFT STATION BLDG.
25D	U.V. DISINFECTION BLDG.
25E	DIGESTER & CONTROL BLDG.
25F	SLUDGE DRYING BEDS
25G	PRIMARY SETTLING BASINS
25H	TRICKLING FILTERS
25J	10 PLEXS SEWAGE LIFT STATION
26A	PUMP HOUSE-HP FIRE PROTECTION
26B	ELEVATED WATER STORAGE TANK
26C	MAIN ELECTRICAL STRAINER HOUSE
28A	SECURITY BLDG.
28B	HUMAN RESOURCES BLDG.
28C	GUARD POST ON SOUTH END OF "D" STR. (REMOVED)
28D	GUARD POST ON WEST END OF "2ND" STR.
28E	GUARD POST AT T81
28F	SKEET RANGE BLDG.
28G	GUARD POST SOUTH OF BLDG. 51
30A	CHEMICAL WAREHOUSE
30B	DRUM STORAGE WAREHOUSE
30C	OLD TEN TON SCALE (REMOVED)
31A	ENGINE HOUSE/GARAGE
31B	OLD TRUCK SCALE
32A	MAGNESIUM STORAGE BLDG.
32B	BLDG. 32 COVERED LOADING DOCK
34A	K-65 STORAGE TANK (NORTH)
34B	K-65 STORAGE TANK (SOUTH)
34C	RTS BLDG.
35A	METAL OXIDE STORAGE TANK (NORTH)
35B	METAL OXIDE STORAGE TANK (SOUTH)
37	PILOT PLANT ANNEX
38A	PROPANE STORAGE
38B	CYLINDER FILLING STATION
39A	INCINERATOR BLDG.
39B	WASTE OIL DECANT SHELTER
39C	INCINERATOR SPRINKLER RISER HOUSE
39D	SEWAGE TREATMENT PLANT INCINERATOR
44A	TRAILER COMPLEX (6-PLEX)
44C	TRAILER COMPLEX (7-PLEX S.)
44D	TRAILER COMPLEX (7-PLEX N.)
44E	TRAILER COMPLEX (10 PLEX)
45A	CONSTRUCTION DIVISION BLDG.
45B	UTILITY SHED EAST OF RUST TRAILERS
46	HEAVY EQUIPMENT BLDG.
51	ADVANCED WASTEWATER TREATMENT FACILITY (AWWTF)
53A	HEALTH & SAFETY BLDG.
53B	IN-VIVO BLDG.
54A	SIX TO FOUR REDUCTION FACILITY #1
54B	PILOT PLANT WAREHOUSE
54C	PILOT PLANT DISSOCIATOR SHELTER
55A	SLAG RECYCLING BLDG.
55B	SLAG RECYCLING PIT/ELEVATOR
56A	CP STORAGE WAREHOUSE
56B	STORAGE SHED (WEST)
56C	STORAGE SHED (EAST)
60	QUONSET HUT #1
61	QUONSET HUT #2
62	QUONSET HUT #3
63	KC-2 WAREHOUSE
64	THORIUM WAREHOUSE
65	(OLD) PLANT 5 WAREHOUSE
66	DRUM RECONDITIONING BLDG.
67	PLANT 1 THORIUM WAREHOUSE
68	PILOT PLANT WAREHOUSE
69	DECONTAMINATION BLDG.
71	GENERAL IN-PROCESS WAREHOUSE
72	DRUM STORAGE BUILDING
73A	FIRE BRIGADE TRAINING CENTER BLDG.
73B	FIRE TRAINING POND
73C	FIRE TRAINING TANK
73D	FIRE TRAINING BURN TROUGH
73E	CONFINED SPACE BURN TANK
74A	PLANT 2 EAST PAD
74B	PLANT 2 WEST PAD
74C	PLANT 8 EAST PAD
74D	PLANT 8 WEST PAD
74E	PLANT 4 PAD
74F	PLANT 7 PAD
74G	PLANT 5 EAST PAD
74H	PLANT 5 SOUTH PAD
74J	PLANT 6 PADS
74K	PLANT 9 PAD
74L	BUILDING 65 WEST PAD
74M	BUILDING 64 EAST PAD & R.R. DOCK
74N	BUILDING 12 NORTH PAD
74P	DECONTAMINATION PAD
74Q	PLANT 8 OLD METAL DISSOLVER PAD
74R	PLANT 8 NORTH PAD
74S	BUILDING 63 WEST PAD
74T	PLANT 1 STORAGE PAD
74U	PILOT PLANT PAD
74V	LABORATORY PAD
74W	INCINERATOR BLDG. PAD
77	FINISHED PRODUCTS WAREHOUSE (4A)
78	D & D BUILDING
79	PLANT 6 WAREHOUSE
80	PLANT 8 WAREHOUSE
81	PLANT 9 WAREHOUSE
82	RECEIVING/INCOMING MAT'LS. INSP.
88	CLEARWELL LINE
89	PARKING LOTS
T76	INTERIM OFFICE SPACE
T77	INTERIM OFFICE SPACE
T80	INTERIM OFFICE SPACE
T81	INTERIM OFFICE SPACE

FIGURE 3-1
MAP OF OU3 REMEDIATION COMPLEXES

4.0 Scheduling the OU3 Interim Remedial Action

This section discusses the approach to developing the base schedule. The development of this schedule is based on the general assumption that the current management structure planned for the OU3 interim remedial action, as described in Section 7 of the OU3 RD/RA Work Plan, would not be greatly impacted in order to achieve the associated milestones. Constraints on the scheduling of complexes for remediation are presented in Section 4.1, including the drivers used in the prioritization. Section 4.2 presents the sequencing of complexes for dismantlement within these scheduling constraints, as well as the resultant base schedule. This base schedule establishes the proposed milestones for the OU3 interim remedial action.

4.1 Scheduling Constraints

The development of the sequence in which above-grade structures will be dismantled focuses primarily on the need to clear an upgradient area to support OU5 soil remediation and to accommodate the potential On-Property Disposal Facility. Surface and groundwater generally flow from the north to the south, with some gradual east-to-west migration as well. Therefore, in order to avoid contamination of remediated soils, at- and below-grade dismantlement will have more near-term priority in the northeast corner of the former Production Area. To support this, OU3 above-grade structures will be dismantled, to the extent possible, to integrate with OU5 contaminated soil excavation schedules. Also, the dismantlement of structures with basements will be integrated with below-grade remediation to prevent these basements from becoming large collection basins of contaminated storm water run-off or a safety hazard for remediation workers.

As discussed in Appendix E.3 of the OU2 Feasibility Study, the potentially acceptable region for the construction of the proposed On-Property Disposal Facility is shown in Figure 4-1. Since the exact location and dimensions of the On-Property Disposal Facility have not been determined, the development of the OU3 base schedule will assume that the On-Property Disposal Facility may partially cover the northeast corner of the former Production Area, since initial geology indications are favorable for this area.

In general, at- and below-grade remediation activities will progress from the northeast corner of the former Production Area and proceed sequentially to the southwest corner, finishing near the location of the AWWT facility and the proposed soils and debris treatment systems. This sequence will also permit the existing storm sewer system, which flows generally from northeast to south, to be utilized during remediation activities to prevent run-off of contaminated surface waters as construction of the cell modules progresses. Run-off from the On-Property Disposal Facility area could be directed to the Storm Water Retention Basins (SWRB) to provide overall containment until final closure of the facility.

Table 4-1 provides a listing of other major constraints and considerations factored into determining the availability of the complexes for the initiation of Safe Shutdown activities, the necessary precursor to decontamination and dismantlement. This summary list represents a culmination of input from various organizations and stakeholders at the FEMP to ensure the integration of site planning. For example, many of the components have planned uses to support waste management operations, to supply site utilities, or to support removal actions or the remediation of other operable units.

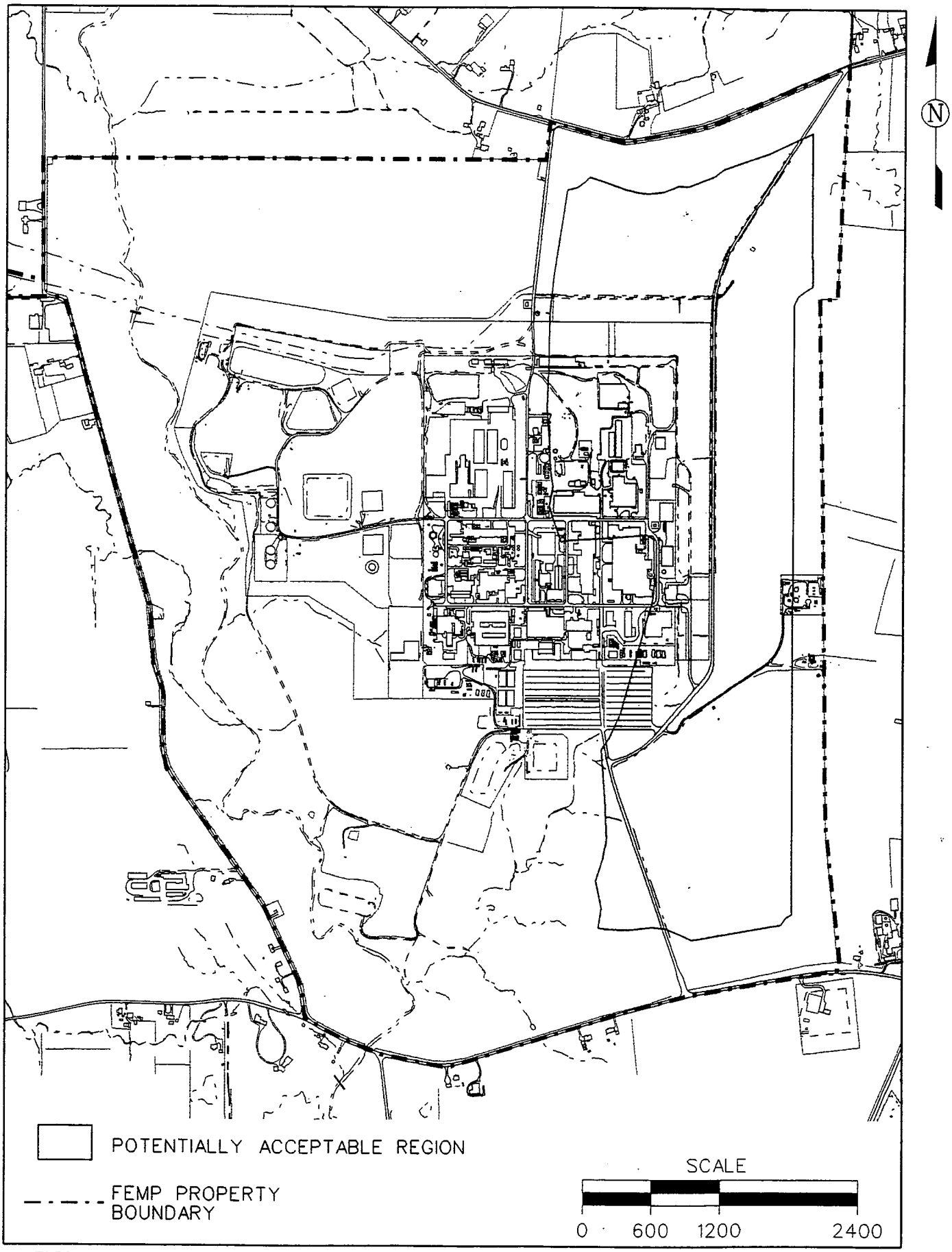


FIGURE 4-1 Potentially Acceptable Region for the Proposed On-Property Disposal Facility

(In + Generation) - (Out + Consumption) = Accumulation

This general mass balance can be modified as follows to apply to material at the FEMP:

(Off-Property Receipts + Material Generation) - (Off-Property Disposition + On-Property Disposal) = Material in Interim Storage

This mass balance equation considers material flow in cubic feet, calculated on a quarterly basis.

The first term in the equation, Off-Property Receipts, represents the current DOE anticipation that the FEMP will not receive off-property materials for on-property storage or disposition. Therefore, in the mass balance equation, the volume of material to be received from off-property sources equals 0 cubic feet per year and drops out of the mass balance equation.

The second term in the equation, Material Generation, represents the volume of material generated at the FEMP that may have to be temporarily stored on-property prior to on- or off-property disposition. The Material Generation term specifically does not include volume estimates for uncontaminated office trash and recyclable materials (e.g., soda cans, toner cartridges, etc.) because they are dispositioned off-property in a timely manner and, therefore, do not require temporary storage in OU3 facilities. The Material Generation term represents the total material burden, current and future, that may potentially require storage facilities prior to disposal. Section A.2 of this appendix defines the sources, types, and quantities of existing materials and materials to be generated and provides the information required to calculate the Material Generation term of the mass balance equation.

The third and fourth terms in the equation, Off-Property Disposition and On-Property Disposal, represent the volumes of those materials defined in Section A.2 that are anticipated to be either shipped off-property for disposal or recycling, or buried in the On-Property Disposal Facility. The disposition of materials generated from the OU1, OU2, and OU4 remedial actions will follow the selected alternatives as defined in their respective Records of Decision (RODs). The disposition of materials generated from the OU5 remedial action is assumed to follow the preferred alternative as defined by the OU5 Proposed Plan (PP). Material generated from the OU3 interim remedial action and the OU3 final remedial action will be dispositioned according to the leading remedial alternative. Following the completion of the public comment period for the OU3 final remedial action PP, the Material Balance Model will be re-evaluated, if necessary, to determine if any changes to the OU3 leading remedial alternative affect the base schedule. Similarly, the Material Balance Model can be adjusted to reflect the remedial action schedules for the operable units as they are published.

For off-property disposal of LLW and mixed waste, this model uses the current rate for off-property shipment of existing materials under Removal No. 9 (Removal of Waste Inventories) to forecast the shipment rate that will occur throughout the duration of the OU3 interim remedial action. To estimate volumes for off-property disposition of recyclable material, the

APPENDIX A
MATERIAL BALANCE MODEL

A.1 Introduction

OU3 facilities will provide the primary location for temporary storage of most materials resulting from FEMP remedial activities over the course of the OU3 interim remedial action. It must be ascertained whether or not sufficient storage capacity will be available within OU3 facilities throughout the project to accommodate generated materials prior to disposition. In consideration of that need, the development of the base schedule, as discussed in Section 4.2 of the PSR, must include an associated analysis of storage capacity over time to determine if the base schedule should be modified or if other possible courses of action need to be considered (e.g., construction of new interim storage facilities) to allow for adequate storage space. The Material Balance Model presented in this appendix provides an analysis of existing storage capacity and the capacity needed for materials that may likely require interim storage during the OU3 interim remedial action. The approach used by the Material Balance Model includes an analysis of:

- types of material, projected volume estimates, and the rate that material will be generated by the remediation of OU3 components and from other FEMP activities that could impact interim storage capacity (i.e., removal actions, remedial actions for OU1 and OU4, and operation and maintenance activities) during the OU3 interim remedial action;

- anticipated disposition rates for materials destined for the On-Property Disposal Facility, off-property recycling/reuse, off-property disposal of low-level radioactive waste (LLW), off-property disposal of hazardous and mixed wastes, and nuclear product disposition; and

- availability of storage capacity according to the type of storage facility allowed for materials throughout the OU3 interim remedial action.

The result from this analysis will identify either a surplus or deficiency of storage capacity over time. That result will then be used in Section 6.0 of the PSR to evaluate the impact of the base schedule on material management.

Because of the continuous generation of material from numerous on-going projects at the FEMP, in addition to the various storage and disposition activities, the data contained within the Material Balance Model is based on a point-in-time view of material management at the FEMP. Therefore, the Material Balance Model refers to all material that was generated prior to the beginning of FY-95 (i.e., October 1, 1994) as "existing material." The Material Balance Model projects the generation of material in FY-95 and beyond based on anticipated FEMP project schedules.

To determine the impact of the base schedule on the FEMP's capacity to store materials, the Material Balance Model uses a general mass balance equation. The general equation for determining the mass balance for material that enters and leaves a system is as follows:

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APPENDIX A

MATERIAL BALANCE MODEL

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6.0 Schedule Implications

The base schedule, as presented in Figure 4-3, results in the elimination of currently available hazardous and mixed waste (RCRA) storage in FY-99, covered (non-RCRA) storage in FY-00, and uncovered storage facilities in FY-02. Based on the results of the material balance analysis presented in Section A.6 of the Material Balance Model (Appendix A), it has been determined that there will be sufficient interim storage capacity at the FEMP for hazardous and mixed waste and for LLW to be stored in covered storage facilities throughout the OU3 interim remedial action.

The material balance for the third category of storage, uncovered storage, shows sufficient capacity until FY-11, but insufficient uncovered storage capacity in later years, given the assumptions specified in this report. The four spikes shown on Figure A.6-3 for FY-11, FY-16, FY-18, and FY-20 are due to the generation of Material Category I, Restricted Use Metals. As discussed in Section A.3.3, the disposition of materials to NTS is limited to 79,000 drum equivalents per year. This limitation is anticipated to be lifted during FY-96, once an Environmental Impact Statement (EIS) is completed for NTS. In the event the limitation on off-site shipment is not lifted, several scenarios have been presented below that would enable the FEMP to increase storage capacity should the need arise:

- store material in controlled piles;
- store material in containers placed on at-grade concrete slabs of dismantled facilities;
- decrease speed of remediation/generation of material; and
- ship LLW to an alternate disposal facility, if available.

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5.0 Submittals of Updated Schedules

Section 6.1 of the OU3 RD/RA Work Plan states that an updated five-year schedule will be submitted annually to the regulatory agencies by the anniversary date of the submittal of the draft PSR. The annual submittal of a five-year schedule was based on the initial approach that the five-year schedule would be developed using projected budget estimates and that project milestones would, therefore, be negotiated annually. However, in order to provide USEPA and OEPA with milestones for the entire OU3 interim remedial action, the base schedule was not developed for only the first five years. Therefore, the base schedule will be updated when necessary (rather than annually) and submitted to the regulatory agencies for review and approval.

The most likely cause for a schedule revision would be a change in the projected funding levels used to develop the base schedule. As discussed in Section 4.2, since the budget for the remediation of the FEMP is approved by the U.S. Congress annually and prioritized at the FEMP for optimal risk reduction, the actual funding for decontamination and dismantlement projects in out-years can only be based on current projections. The base schedule has been developed using these projections, resulting in anticipated annual funding of no more than $10 million throughout the interim remedial action. In the event that additional, unexpected funding for OU3 remediation is obtained, the base schedule will be accelerated accordingly and submitted for regulatory approval.

In addition to the potential for changes in funding, other potential factors that may account for a schedule revision include revisions to the constraints or assumptions discussed in Section 4, changes in remediation priorities, lessons learned from previous or ongoing projects, and improved operation and project management.

TABLE 4-3 Proposed Enforceable Milestones for the OU3 Interim Remedial Action

Complex	Draft Implementation Plan Submittal Dates
Building 4A	19 Sep 94
External Complex	11 Oct 00
Thorium/Plant 9 Complex	9 Mar 01
Boiler Plant/Water Plant Complex	1 Apr 02
Tank Farm Complex	8 Oct 04
Plant 1 Complex	13 Oct 04
Maintenance Complex	28 Jun 06
East Warehouse Complex	29 Jun 07
Plant 3 Complex	21 Sep 07
Plant 2 Complex	24 Jun 09
Plant 8 Complex	24 Aug 11
General Sump Complex	30 Jul 13
Plant 5 Complex	16 Jun 14
Plant 6 Complex	15 Aug 16
Liquid Storage Complex	29 Aug 18
Pilot Plant Complex	19 Mar 19
Laboratory Complex	4 Nov 20
Electrical Complex	24 Sep 21
Sewage Treatment Plant Complex	26 Sep 22
Administration Complex	23 Dec 22

- the potential to reduce future maintenance costs, thereby increasing funding availability for environmental restoration activities.

Section 120(e)(2) of CERCLA requires that "substantial continuous physical onsite remedial action shall be commenced at each facility not later than 15 months after completion of the investigation and study." The IROD identifies two removal actions, Removal of Waste Inventories (Removal No. 9) and Safe Shutdown (Removal No. 12), that will be used from a lessons learned perspective in designing the remedial actions and four others (noting that all other removal actions were anticipated to be completed prior to initiation of the OU3 interim remedial action) that will be "coordinated and integrated with" remedial action activities. This language ties the removal actions, especially Safe Shutdown, directly to the OU3 interim remedial action. By focusing available funding in the earlier years on Safe Shutdown activities, the overall remediation goals for the OU3 interim remedial action do not change, rather the work is phased in a manner which best utilizes funding. Safe Shutdown is essential to the implementation of the decontamination and dismantling of the structures; in fact, it represents the major component of the decontamination phase of the OU3 interim remedial action. Therefore, Safe Shutdown activities should be considered to represent "substantial continuous physical onsite remedial action" under the OU3 interim remedial action until dismantling of structures can resume.

4.3 OU3 Interim Remedial Action Milestone Dates

The establishment of enforceable milestone dates follows an iterative process wherein certain milestones can be established at the design phase, while others cannot be established until design is complete and remediation is set to begin. Even though the RD/RA planning documents for the OU3 interim remedial action are somewhat different than those traditionally seen, the establishment of milestones needs to still follow that same iterative process. Specifically, prior to design, milestones should be reflective of the submittal of design documents, and through the design, more definitive remediation start and completion dates can be established. For the PSR, therefore, the enforceable milestones which can be legitimately established are the submittal of the draft implementation plan for each of the complexes. Until details of the design have been completed, definitive project durations cannot be established. Without these durations, project start and completion dates are uncertain. Accordingly, Table 4-3 provides a listing of proposed enforceable milestones dates reflective of the submittal of the draft implementation plan for each of the defined complexes. These dates are based on three main factors: project durations are reflective of best estimates with the information currently available; as one construction project is completed, the next will start, thus providing for continuous remediation activities; and the submittal of the draft implementation plan is anticipated to correspond approximately to the 60% design review level of information, with the design/procurement period having been established based on the complexity and anticipated dollar value of the project. When the individual implementation plans are submitted, they will then propose enforceable milestones for the start and completion of remediation activities for that particular project (e.g., Notice to Proceed, draft submittal of the RA Report, etc.).

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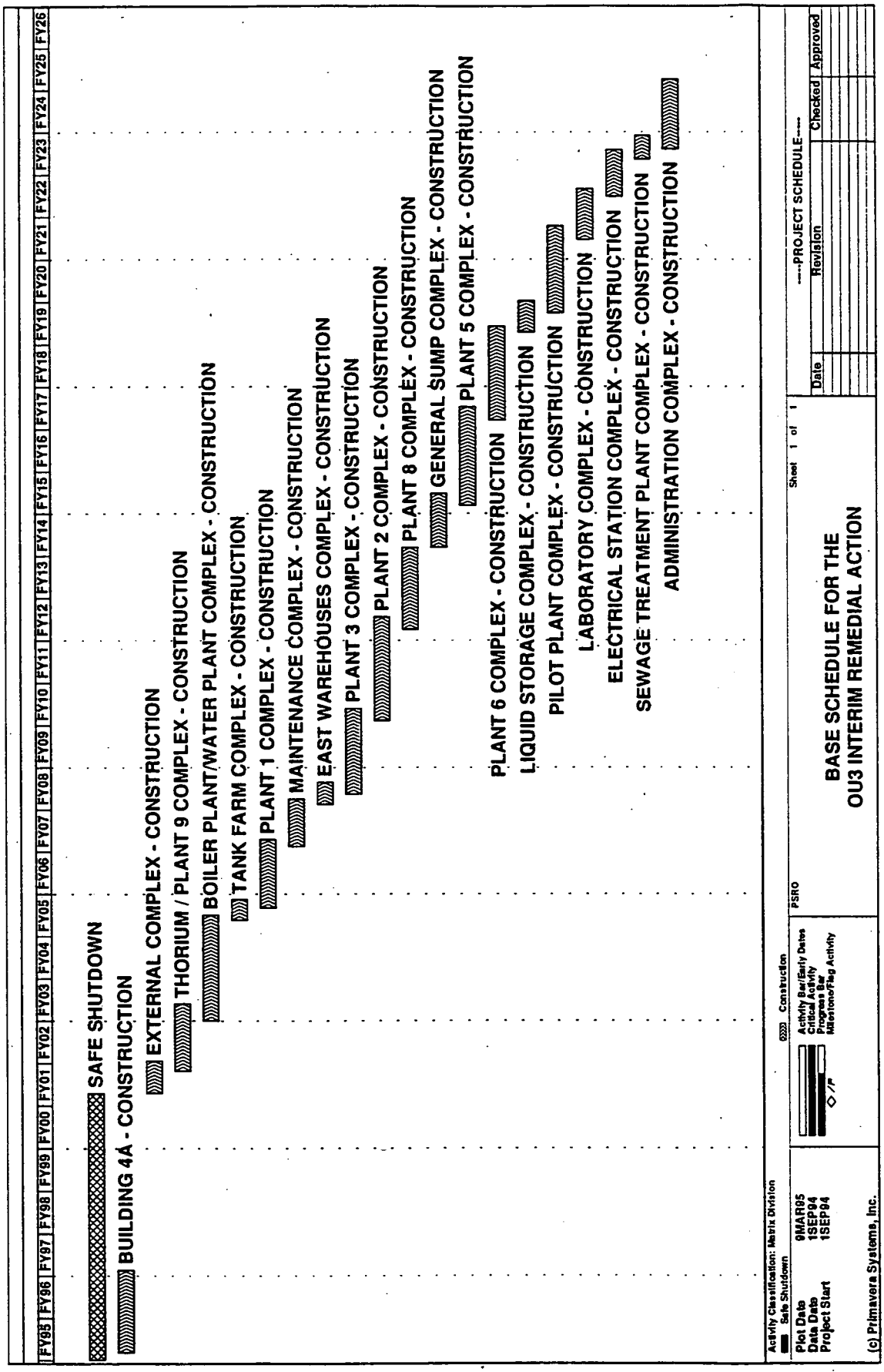

FIGURE 4-3 Base Schedule for the OU3 Interim Remedial Action

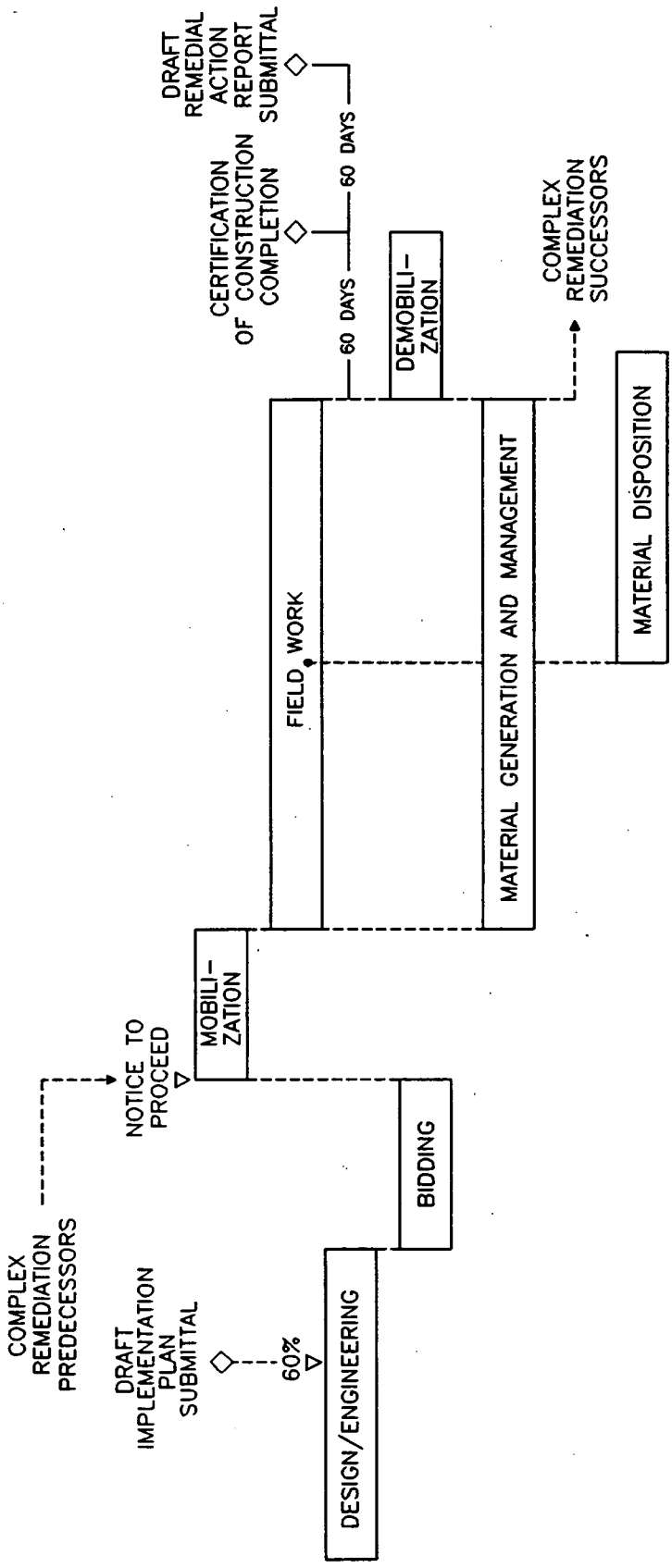

FIGURE 4-2 Conceptual Scheduling for a Generic Complex

Figure 4-2 conceptually shows the scheduling of activities for a complex that was used in developing the base schedule. For example, the submittal of the draft implementation plan is anticipated to approximately correspond to the 60% design review level of information. It is important to note that activities performed prior to the issuance of the Notice to Proceed (e.g., Safe Shutdown, remedial design, etc.) can occur in advance and are not necessarily tied to the Notice to Proceed.

Figure 4-3 shows the proposed base schedule for the OU3 interim remedial action. This funding-constrained schedule is intended to represent the results of applying various constraints, as described above, to the OU3 remediation sequence. The base schedule provides the anticipated flows and durations for remediation activities for each of the complexes, including the Safe Shutdown effort. This schedule is the basis for determining the proposed submittal dates for the implementation plans, which are discussed in Section 4.3 as the proposed enforceable remedial design milestones for the OU3 interim remedial action. More specific schedules for each complex would be submitted in the respective complex implementation plans. Milestones for the OU3 interim remedial action are discussed further in Section 4.3.

As stated before, the OU3 PP/EA stated that the OU3 interim remedial action will span sixteen years if annual funding does not become a constraint. Although it is not realistic to expect unlimited funding, the actual funding which will be available for the OU3 interim remedial action is uncertain over the course of the action. As a means to project the duration of the project, a base remediation sequence was developed and a projected funding basis was applied as a constraint. The application of funding constraints is anticipated to determine the rate at which the remedial action can progress, as well as the completion date for the remediation project.

The OU3 PP/EA identified the probable duration and period for the interim remedial action as sixteen years, beginning in FY-96 and ending in early FY-12. This sixteen year schedule was based on an estimate of total project hours and a levelized workforce and did not reflect consideration for inter-project coordination or budget constraints. Because of an accelerated completion of the IROD documentation process, coupled with the approval of the Building 4A Implementation Plan, field activities for the OU3 interim remedial action are now planned to begin in FY-95. Project planning has also progressed to a much greater level of detail, supporting a more definitive schedule development based on anticipated site funding and current remediation priorities.

The proposed base schedule for the OU3 interim remedial action, as depicted by Figure 4-3, reflects a strategy that provides the best utilization of anticipated funds to complete the goals of the interim remedial action. In this regard, the strategy presented in the schedule reflects a concentrated effort on the completion of Safe Shutdown activities under Removal No. 12. Benefits from the timely completion of the Safe Shutdown scope of work allows for:

- minimizing potential conflicts between this removal action and other decontamination and dismantlement activities;
- placing all facilities in a condition which can be more clearly defined to the remediation subcontractor;
- more flexibility in modifying the sequence; and

Production Area to clear the area in anticipation of the On-Property Disposal Facility and then to complete remediation along the northern portion (north of Second Street) of the former Production Area.

As the above-grade remediation north of Second Street comes to completion, the remediation activities between First and Second Streets increase. The remediation of the southern complexes is last, but the Sewage Treatment Plant Complex is also later in the schedule, since no specific drivers were identified. If the Sewage Treatment Plant Complex is determined to require removal to support development of the proposed On-Property Disposal Facility, it can be repositioned earlier in the sequence.

TABLE 4-2 Complex Sequence Priority for Remediation

Complex	Components
Building 4A	4A
External Complex	28F, 39D, 69
Thorium/Plant 9 Complex	9A, 9B, 9C, 9D, 9E, 9F, 32A, 32B, 64, 65, 78, 81
Boiler Plant/Water Plant Complex	10A, 10B, 10C, 10E, 20A, 20B, 20C, 20H, 24A, P-005
Tank Farm Complex	19A, 19C, 19D, 19E
Plant 1 Complex	1A, 1B, 30A, 30B, 56A, 56B, 56C, 60, 61, 62, 63, 66, 67, 71, 72, TS-004 through TS-006
Maintenance Complex	12A, 12B, 12C, 12D, 24B, 38A, 38B
East Warehouses Complex	20D, 77, 79, 82
Plant 3 Complex	3B, 3C, 3D, 3E, 3F, 3G, 3J, 3K, 39A, 39C
Plant 2 Complex	2A, 2D, 2E, 2F, 2G, 39B
Plant 8 Complex	8A, 8B, 8C, 8D, 8E, 8F, 80
General Sump Complex	2B, 2C, 3A, 3H, 3L, 18B, 18D, 18H
Plant 5 Complex	4B, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 55A, 55B
Plant 6 Complex	6A, 6B, 6C, 6D, 6E, 6F, 6G
Liquid Storage Complex	18J, 18K, 18L, 20E, 20F, 20G, 22A, 22B, 22D, 26A, 26B, 45A, 45B
Pilot Plant Complex	13A, 13B, 13C, 13D, 37, 54A, 54B, 54C, 68
Laboratory Complex	15A, 15B
Electrical Station Complex	16A, 16B, 16C, 16D, 16E, 16F, 16G, 26C, 31A, 46
Sewage Treatment Plant Complex	25A, 25B, 25C, 25D, 25E
Administration Complex	11, 14A, 14B, 28A, 28B, 53A, 53B

- The next step involves analysis of the implications of executing a funding-constrained (base) schedule for remediation. The schedule was first tested versus the scheduling constraints listed in Table 4-1 for the components within each complex. There were many component-specific scheduling constraints that were assessed versus the schedule, since many of the components are necessary to either support remediation activities or required site activities (i.e., AWWT, RCRA warehouses, ongoing maintenance, etc.) and cannot be scheduled for removal until these activities are relocated, replaced, or no longer necessary. There were no significant schedule revisions necessary due to component availability issues, although several current activities were identified for relocation to facilities to be remediated later in the schedule.

- The next step was to ensure that the schedule did not heavily impact the network of required site utilities. Site utilities include electricity, plant air (used for air-supplied respirators), instrument air, natural gas, propane gas, fire protection water, sanitary water, process water, steam, sanitary sewers, storm water, cooling water, roadways, and telephones. If the utilities are not required for the safe, efficient, and cost-effective removal of a complex, the utility lines will be capped or terminated near the boundaries of each complex (for above-grade activities) or remediation area (for at- and below-grade activities) before dismantlement begins. Utility connections to the occupied areas of the FEMP will be maintained by temporary connections, as needed. Since the utilities are generally fed from sources along the southern portions of the former Production Area, the impact of a general northeast to southwest remediation strategy was determined to be minimal, but at later stages of the project, more significant utility issues would arise than during the initial phases of the project.

- The final step was to determine whether the remediation schedule could be executed within the current and future projected availability of on-site interim storage capacity. The existing containerized material and waste inventory is known and the space that it currently requires for storage is also known. A Material Balance Model was developed using the base schedule and the resulting waste generation rates, waste disposition rates, and storage facility removal dates as a basis to determine the feasibility of executing the schedule. The material balance analysis presented in Appendix A demonstrated the feasibility of the execution of the proposed schedule.

The results of evaluating the funding-constrained, or base schedule for the remediation of OU3 complexes are provided in Table 4-2. This table prioritizes the ordering of above-grade complexes based on the constraints and considerations presented in Table 4-1 and indicates the sequence for remediation of the complexes.

As depicted by Table 4-2, Building 4A and the External Complex were identified as the first two complexes to be remediated because of their immediate availability for remediation. After these complexes, remediation is focused heavily in the northeast corner of the former

It is important to note that many of the component/complex-specific constraints and considerations listed in Table 4-1 do not actually impact when a complex can be remediated. Rather, they represent the major issues (e.g., often relocation of activities) that would have to be addressed by the Design, Engineering, and Construction (DEC) Team during the detailed planning phase for the remediation of that complex.

4.2 Developing the Interim Remedial Action Sequence and Schedule

The OU3 PP/EA stated that the OU3 interim remedial action will span sixteen years if annual funding does not become a constraint. Although it is not realistic to expect unlimited funding, the actual funding which will be available for the OU3 interim remedial action is uncertain over the course of the action. As a means to project the duration of the project, a base remediation sequence was developed and a projected funding basis was applied as a constraint. The application of funding constraints, as discussed further below, is anticipated to determine the rate at which the remedial action can progress, as well as the completion date for the remediation project. This subsection describes the approach utilized in developing the sequence that represents the relationship for remedial activities for the entire OU3 interim remedial action.

The approach used in developing an unconstrained base sequence for the remediation of above-grade structures is explained below. This approach is an iterative process to ensure that all factors are considered and to allow the adaptation of the base sequence to changing FEMP remediation strategies and plans.

- The first step in developing the base sequence was to fully understand the external project drivers. The primary drivers included the proposed On-Property Disposal Facility and a possible preferred location to the northeast of the former Production Area, the site surface and subsurface hydrology (flows generally from northeast to southwest), and the need to remove OU3 structures to allow access for contaminated soils remediation in the former Production Area. Without other considerations, the complexes which make up OU3 would be removed, one after another, from the northeast to the southwest. However, other considerations are significant contributors.

- The second step in the approach was to develop cost estimates for completing the remediation project and determine the overall schedule resulting from the application of anticipated funding levels for the project. Since the budget for the remediation of the FEMP is, like funding activities for all government agencies, approved by the U.S. Congress on an annual basis, the actual funding for out-years can only be based on current projections. As a result, budgetary forecasts for out-years are by no means guaranteed. The current funding for OU3 decontamination and dismantlement efforts is approximately $10 million in FY-95. In the current five-year planning budget for the site, a significant decrease in annual funding is projected; therefore, the base schedule has anticipated an annual funding basis of no more than $10 million throughout the interim remedial action. The resulting duration is approximately 30 years for the estimated project costs of $300 million (including Safe Shutdown costs).

TABLE 4-1 Scheduling Constraints and Considerations (Cont'd)

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Thorium/Plant 9 Complex (9A, 9B, 9C, 9D, 9E, 9F, 32A, 32B, 64, 65, 78, 81)	• All components lie in the potential path of the cell. • The Special Products Plant (9A) houses the Minimum Additive Waste Stabilization facility which may or may not be further funded. If it is funded, MAWS is expected to operate until mid-1996. • The Plant 9 Dust Collector (9C) supports the Minimum Additive Waste Stabilization facility as well. • Components 9B, 9D, 9E, and 9F are available for immediate remediation. • Plant 9 Warehouse (81) is a RCRA storage area (HWMU 35) that contains lead-based paint chips. These are scheduled to be shipped off-property by 10/96. • Magnesium Storage Building and Loading Dock (32A and 32B) are used as staging facilities for excess materials. • Thorium overpacking operations in Building 64 are scheduled to be complete by 12/96, which will also empty Building 65. • Building 64 also contains a RCRA 90-day holding area. • The new D&D Building (78) houses a waterwash system used for cleaning contaminated vehicles. This system or an equivalent system will have to be established elsewhere on-property.
Grade and Below-Grade Components	• The at- and below-grade portions of the Sewage Treatment Plant Complex may be remediated in conjunction with the above-grade portion, since the Sewage Treatment Plant falls outside of the former Production Area and Administration Area.

TABLE 4-1 Scheduling Constraints and Considerations (Cont'd)

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Plant 6 Complex (6A, 6B, 6C, 6D, 6E, 6F, 6G)	• The north side of the Plant 6 complex falls in the potential path of the cell. • The Metals Fabrication Plant (6A) is the largest heated LLW warehouse at the FEMP, and also houses a new sampling line that was moved from Building 1A. • Since Building 6A has a large basement, the above-grade and below-grade remediation would either have to be performed concurrently or the basement would have to be covered with a tarp, TSS, etc. • A perched water holding tank is currently located in the basement. • All peripheral structures attached to Building 6A are not being used and are available for remediation. • Closure of HWMU 3 is scheduled to be complete in 1995.
Plant 8 Complex (8A, 8B, 8C, 8D, 8E, 8F, 80)	• None of the components lies in the potential path of the cell. • The Recovery Plant (8A) is used for day-to-day treatment of uranium-bearing wastewaters as well as VOC treatment of perched water. Both processes will be replaced by AWWT in January, 1997. • UNH stabilization and processing also utilizes the wastewater treatment system. It is anticipated that the thorium nitrate in T-2 of the Pilot Plant Thorium Tank Farm (13D) will be sent to the Plant 8 wastewater treatment system after the processing of UNH has been completed. • The Rotary Kiln/Drum Reconditioning Building (8C) contains the OU5 soil pilot plant project (until mid-96) and the new contaminated trash baler (starting in 1995). • The Plant 8 Warehouse (80) currently stores dry RCRA wastes and is listed on the Part B Permit application (HWMU 29). • All other components in the complex are available for remediation.
Sewage Treatment Plant Complex (25A, 25B, 25C, 25D, 25E)	• The Sewage Treatment Plant lies in the potential path of the cell. • The Sewage Treatment Plant needs to handle FEMP sewage until the BDN Effluent Treatment Facility takes over in 10/98. • Potential for re-piping and new sewage lift station to route sewage to BDN Effluent Treatment Facility, which will be handled by OU5. • The FEMP effluent sampling point (25B) will be moved from Manhole-175 to downstream of Manhole-176 once the Sewage Treatment Plant is shut down. • There is a high potential for above-grade and below-grade removal to be integrated as a single removal project. If so, the Sludge Drying Beds (25F), Primary Settling Basins (25G), and Trickling Filters (25H) would be added to the complex.
Tank Farm Complex (19A, 19C, 19D, 19E)	• The Main Tank Farm (19A) will be used for the remediation of the HF Tank Car (HWMU 38), which is expected to be completed by 2/95. • The Old North Tank Farm (19D) contains HWMU 8, which will be closed by 10/96. However, this HWMU involves only below-grade work.

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TABLE 4-1 Scheduling Constraints and Considerations (Cont'd)

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Plant 1 Complex (1A, 1B, 30A, 30B, 56A, 56B, 56C, 60, 61, 62, 63, 66, 67, 71, 72, TS-004 through TS-006)	• KC-2 Warehouse (63) lies in the potential path of the cell. The other components do not. • KC-2 Warehouse is the only place that liquid ignitables are currently stored. It is anticipated that the current inventory of RCRA wastes will either be treated, delisted, or shipped off-property to Envirocare by the end of FY-95. • KC-2 Warehouse is a RCRA Part B Permit-listed storage facility (HWMU 34). • The Preparation Plant (1A) contains most of the highest enriched uranium at the FEMP in the "rabbit hutches." • The electrical, phone, and Radiation Detection Alarm systems are being rerouted to a new utility distribution center on the southwest corner of Second and A Streets. • The drum crusher in the Drum Reconditioning Building (66) will be replaced with a portable crusher (up to 85-gallon drums) in 1995. • Quonset Hut #1 (60) currently contains OU4 archived samples that must be kept until 2000. These samples would have to be relocated for remediation to occur earlier. • Quonset Huts #2 and #3 (61 and 62) store low-level radioactive wastes (LLW). • An evaluation of the need for these warehouses can be performed as soon as a draft remediation schedule is completed. • Many of these components support operations on the Plant 1 Pad (74T). • The Chemical Warehouse (30A) contains the X-ray machine for container inspections. • The CP Storage Warehouse (56A) is a Part B RCRA storage facility. • The General In-Process Warehouse (71) is used as the center for the preparation of off-property waste shipments.
Plant 2 Complex (2A, 2D, 2E, 2F, 2G, 39B)	• None of the components lies in the potential path of the cell. • Storage tanks around and in the Ore Refinery Plant (2A) and the NFS Storage and Pump House (2E) contain UNH that will be processed as part of Removal No. 20. • The Metal Dissolver Building (2D), the Cold and Hot Side Ore Conveyor (2F and 2G), and the Waste Oil Decant Shelter (39B) are all available for immediate remediation.
Plant 3 Complex (3B, 3C, 3D, 3E, 3F, 3G, 3J, 3K, 39A, 39C)	• None of the components lies in the potential path of the cell. • The Incinerator Building (39A) currently contains the contaminated trash baler. The new trash baler has been installed in the Rotary Kiln/Drum Reconditioning Building (8C) and will be operation in 95. • All other components in the complex are available for remediation.
Plant 5 Complex (4B, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 55A, 55B)	• The north side of the Plant 5 complex falls in the potential path of the cell. • Plant 4 Warehouse (4B) is full of green salt (UF_4) product for sale under Removal No. 12. • The Plant 5 Covered Storage Pad (5F) and the Plant 5 Ingot Storage Shelter (5G) also store product materials. • All other components appear to be available for remediation, once some stored material is removed from the Metals Production Plant (5A).

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TABLE 4-1 Scheduling Constraints and Considerations (Cont'd)

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Laboratory Complex (15A, 15B)	• Neither of the components lies in the potential path of the cell. • The Laboratory (15A) supports a large percentage of the analytical needs for the FEMP, with the remaining work subcontracted out. All analytical work would have to be subcontracted out or relocated in order to remediate the lab. • Because the lab has a large basement, the dismantlement of the lab would have to be coordinated with the below-grade work to prevent the collection of storm water. • The Laboratory Chemical Storage Building (15B) is a new structure that was built to safely store chemicals needed to support analytical work in the lab. • The lab also contains many office workers who could be relocated without affecting analytical operations.
Liquid Storage Complex (18J, 18K, 18L, 20E, 20F, 20G, 22A, 22B, 22D, 26A, 26B, 45A, 45B)	• The Gas Meter Building (22A) lies in the potential path of the cell. The gas line enters from the east boundary of the FEMP and runs underground in the potential path of the cell. This gas line would have to be relocated prior to construction of the cell and would likely be routed directly to the two gas-fired boilers that will replace the Boiler Plant. • The Methanol Tank (18J) is needed to support the UNH project until 12/95. • The Low and High Nitrate Tanks (18K and 18L) are available for immediate remediation. • Well Houses #1 and #2 (20E and 20F) are used to supply the FEMP with potable water, until the county water hook-up. Well House #3 (20G), the Pump House (26A), and the Elevated Water Storage Tank (26B) are needed for back-up fire protection. • The Rust Engineering Building (45A) is presently being used as offices. These would have to be relocated to trailers (or another facility) before remediation.
Maintenance Complex (12A, 12B, 12C, 12D, 24B, 38A, 38B)	• All components lie in the potential path of the cell. • Maintenance support activities provided from the Main Maintenance Building (12A) would either have to be relocated prior to dismantling Building 12A. • Lumber Storage Building (12C), the Maintenance Building Warehouse (12D), Propane Storage (38A), and the Cylinder Filling Station (38B) are available for immediate remediation.
Pilot Plant Complex (13A, 13B, 13C, 13D, 37, 54A, 54B, 54C, 68)	• None of the components lies in the potential path of the cell. • The components do not have an anticipated future use and design is complete. • The Pilot Plant Thorium Tank Farm (13D) has 6,000 gallons of thorium nitrate contained in T-2. The anticipated plans for the removal of the thorium nitrate involve neutralizing it in a similar manner to UNH, once the UNH removal action has been completed. • Radiation technicians occupying the Pilot Plant Maintenance Building (13B) will have to be relocated to a trailer (or other facility) before remediation.

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TABLE 4-1 Scheduling Constraints and Considerations (Cont'd)

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Building 4A (4A)	• The Green Salt Plant (4A) does not lie in the potential path of the cell. • Building 4A is currently available, design is complete, and the implementation plan has been submitted to and approved by USEPA.
East Warehouses Complex (20D, 77, 79, 82)	• All components lie in the potential path of the cell. • The Elevated Potable Storage Tank (20D) may be needed after county water hook-up for emergency water storage. • The Plant 6 Warehouse (79) is a RCRA storage facility (HWMU 35). • Receiving/Incoming Materials Inspection (82) may have to be relocated if there is a continued need for the facility at the time of remediation. • A Fuel Unloading Station (6000 gallon gas tank and 6000 gallon diesel tank) is scheduled to be built beside Building 82.
Electrical Station Complex (16A, 16B, 16C, 16D, 16E, 16F, 16G, 26C, 31A, 46)	• All components lie in the potential path of the cell, except for the Electrical Substation (16B). • The Main Electrical Station (16A) provides the main electrical feed for the FEMP. It receives 132 kV feeds from off-property and transforms it to 13.2 kV and feeds the power to local substations around the facility. • The Electrical Substation is a secondary unit substation that receives 13.2 kV and transforms it to 480V to power the Health and Safety Building (53A), the Human Resources Building (28B), the Security Building (28A), and the southeast trailer complex. • Trailer Substation #1 and #2 (16F and 16G) are power distribution points that receive 480 V from the Electrical Substation (16B) and transforms it to 208 V to power the southeast office trailers. • The Main Electrical Strainer House (26C) provides fire sprinkler protection for the Electrical Substation. • The Engine House/Garage (31A) and Heavy Equipment Building are currently being used as motor vehicle repair area and house fire trucks, ambulances, and heavy equipment.
External Complex (28F, 39D, 69)	• All components lie in the potential path of the cell. • All components are currently available, design is complete, and the implementation plan is being prepared for submittal to USEPA.
General Sump Complex (2B, 2C, 3A, 3H, 3L, 18B, 18D, 18H)	• None of the components lies in the potential path of the cell. • The Maintenance Building (3A) currently supports Plant 8, Plant 2/3, and General Sump activities. The connecting building, the Electrical Power Center Building (3L), is the major electrical control center for area structures. • The General Sump (18B), Refinery Sump (3H), the BDN Effluent Treatment Facility (18H), and the General/Refinery Sump Control Building (2B) support wastewater and process area storm water control. With the exception of the BDN Effluent Treatment Facility (which will replace the Sewage Treatment Plant in 10/98), these components will all be replaced with the AWWT. • Part of the UNH stabilization process occurs in the General Sump. • The other components in the complex are available for remediation.

TABLE 4-1 Scheduling Constraints and Considerations

Complex/Components	Scheduling Constraints and Considerations Within the Complex
Administration Complex (11, 14A, 14B, 28A, 28B, 53A, 53B)	• None of the components lies in the potential path of the cell. • The Services Building (11) is the radiological control point for the former Production Area. The traffic through this point should greatly diminish before the building would be available for remediation, making it easier to relocate the control point. • The Services Building houses the maintenance facilities for the administration buildings. • The Services Building also houses the lockers and shower facilities for workers in the former Production Area. These would have to be relocated to trailers or another building if a need still exists for these services. • The Administration Building (14A), the Human Resources Building (28B), and the Health and Safety Building (53A) are three of the most populated office buildings at the FEMP. Again, personnel would have to be relocated to trailers and/or off-property before these buildings can be remediated. • The Building 14 EOC Generator (14B) provides back-up power to the Emergency Operations Center, which is located in the Administration Building. • The Health and Safety Building, in addition to personnel, contains Medical and the Communications Center. • The services provided by the In-Vivo Building (53B) would have to be subcontracted out or moved to continue to support the monitoring of radiological workers. • The Security Building (28A) is primarily used as the vehicle access control point for the FEMP and as the headquarters for the security force.
Boiler Plant/Water Plant Complex (10A, 10B, 10C, 10E, 20A, 20B, 20C, 20H, 24A, P-005)	• The Coal Pile (P-005) is the only component in this complex that lies in the potential path of the cell. • The Wet Salt Storage Bin (10C) is available for immediate remediation. • Temporary boilers would be needed to replace steam generation from the Boiler Plant (10A). The largest impact to installing the temporary boilers would be routing the steam to the main feeder line. An engineering effort is underway to design the installation of two gas-fired boilers in one of three proposed locations. • If timed properly, the Boiler Plant could operate until the Coal Pile disappears. • The county water hook-up should be completed by July 1995. • The water softening system in the Services Building can be used for the temporary boilers after the county water hook-up. • The 750,000-gallon Process Water Storage Tank (20H) would be the preferred holding tank for emergency water use after county water hook-up, but, using a pressurized piping system, the 200,000-gallon east water tower (20D) could be used instead. • The administration buildings could be air conditioned by routing the south plume groundwater through a cooling system in Building 51. • Although the Railroad Scale House (24A) will not be used to weigh exiting rail cars during shipment of OU1 materials, the dismantlement of the structure may potentially impact the OU1 schedule. Specifically, the Scale House covers a pit that would have to be either remediated or filled after the structure is removed.

A.2.3 Removal Action Materials

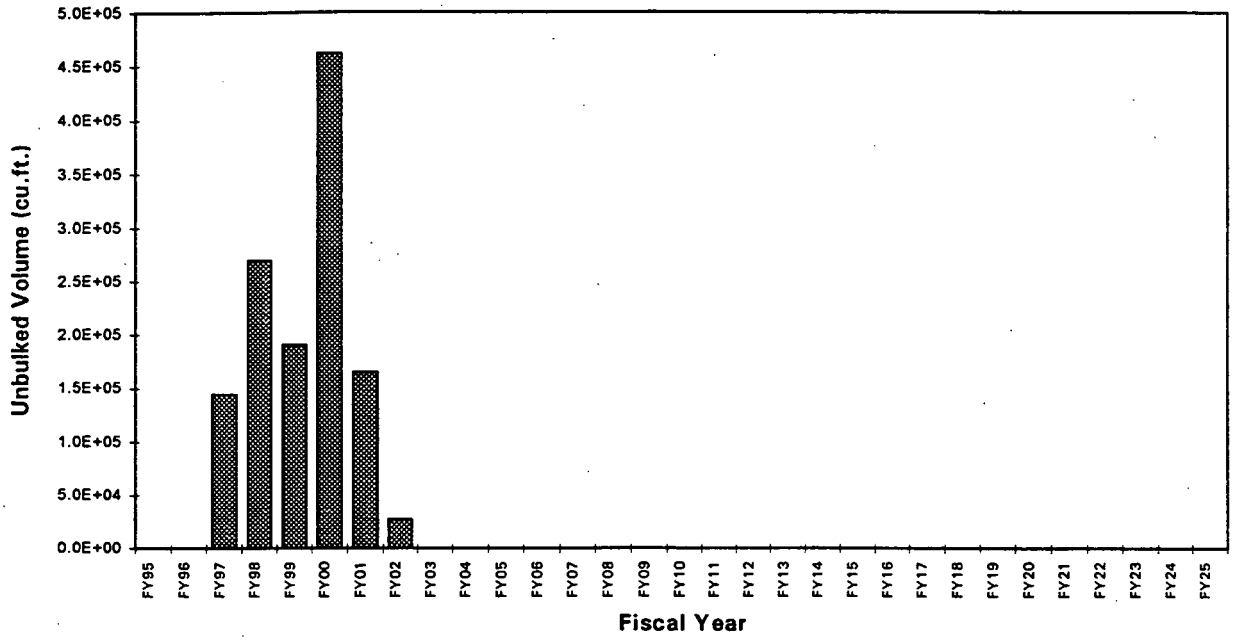
This section identifies the various material types, unbulked volume estimates, and timing for each removal action that is expected to generate wastes after FY-94. Seventeen removal actions have either been completed or are not expected to generate further material after FY-94 and are therefore not included in the Material Balance Model. Those removal action materials that were generated before FY-95 are accounted for as part of existing material in the discussion on Removal No. 9 (Removal of Waste Inventories). The removal actions that are not expected to generate waste after FY-94 are as follows:

- Removal No. 2 (Waste Pit Runoff Control);
- Removal No. 4 (Silos 1 and 2);
- Removal No. 5 (Decant Sump Tank);
- Removal No. 6 (Waste Pit 6 Residues);
- Removal No. 7 (Plant 1 Pad Continuing Release);
- Removal No. 8 (Inactive Flyash Pile Control);
- Removal No. 10 (Active Flyash Pile Control);
- Removal No. 11 (Pit 5 Experimental Treatment Facility);
- Removal No. 14 (Contaminated Soils Adjacent to the Sewage Treatment Plant Incinerator);
- Removal No. 15 (Scrap Metal Piles);
- Removal No. 18 (Control Exposed Material in Pit 5);
- Removal No. 21 (Expedited Silo 3);
- Removal No. 22 (Waste Pit Area Containment Improvement);
- Removal No. 23 (Inactive Flyash Pile);
- Removal No. 24 (Pilot Plant Sump);
- Removal No. 25 (Nitric Acid Tank Car and Area); and
- Removal No. 27 (Management of Contaminated Structures at the FEMP).

As a result of previous FEMP operations (operations and maintenance, removal actions, construction projects), various types of contaminated soil and debris were generated, managed, treated, and stored. Because of limited disposal capacity and uncertainty regarding the required final disposition of these waste materials, soil and debris had been accumulated and was being stored at the FEMP in open piles, which led to concerns over potential contaminant releases to the environment. Removal No. 17 (Improved Storage of Soil and Debris) was established to provide the management framework and implementation strategy for the improved storage of existing and to-be-generated soils and debris. Because this removal action is intended to provide the management strategy for existing and to-be-generated materials from other removal actions, remedial actions, and other FEMP projects, Removal No. 17 is not considered to generate materials; any materials that are managed under Removal No. 17 have been included in other volume generation rates in this appendix.

The removal actions that are expected to generate material beginning in FY-95 are discussed below. The predominant period for material generation for these removal actions will be in FY-95, since it is expected that material generation for each of these removal actions, except Removal Nos. 12 and 30, will take place during that period. The associated unbulked volumes of material have been included in the Material Balance Model. Although Removal No. 16 (Collect Uncontrolled Production Areas Stormwater Runoff) and Removal No. 29 (Stabilization of Paddy's Run Bank near the Active Flyash Pile) were not completed in FY-94, they are not expected to generate a significant quantity of material and have therefore not been included in the Material Balance Model.

Annual Generation of Operable Unit 4 Materials



Cumulative Generation of Operable Unit 4 Materials

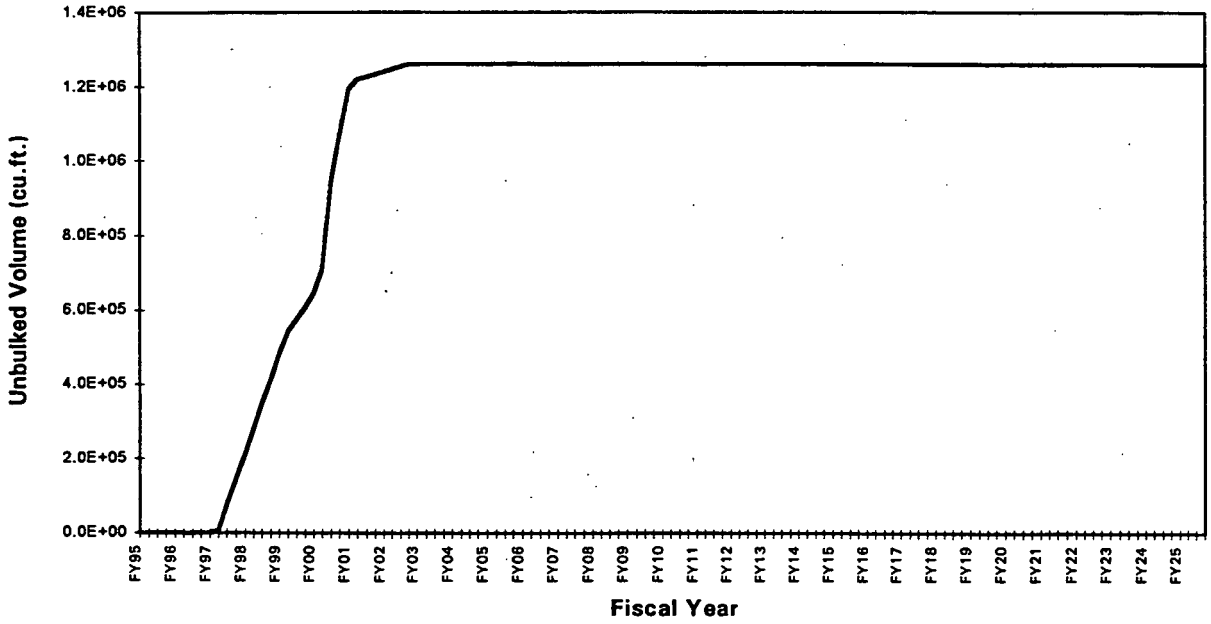
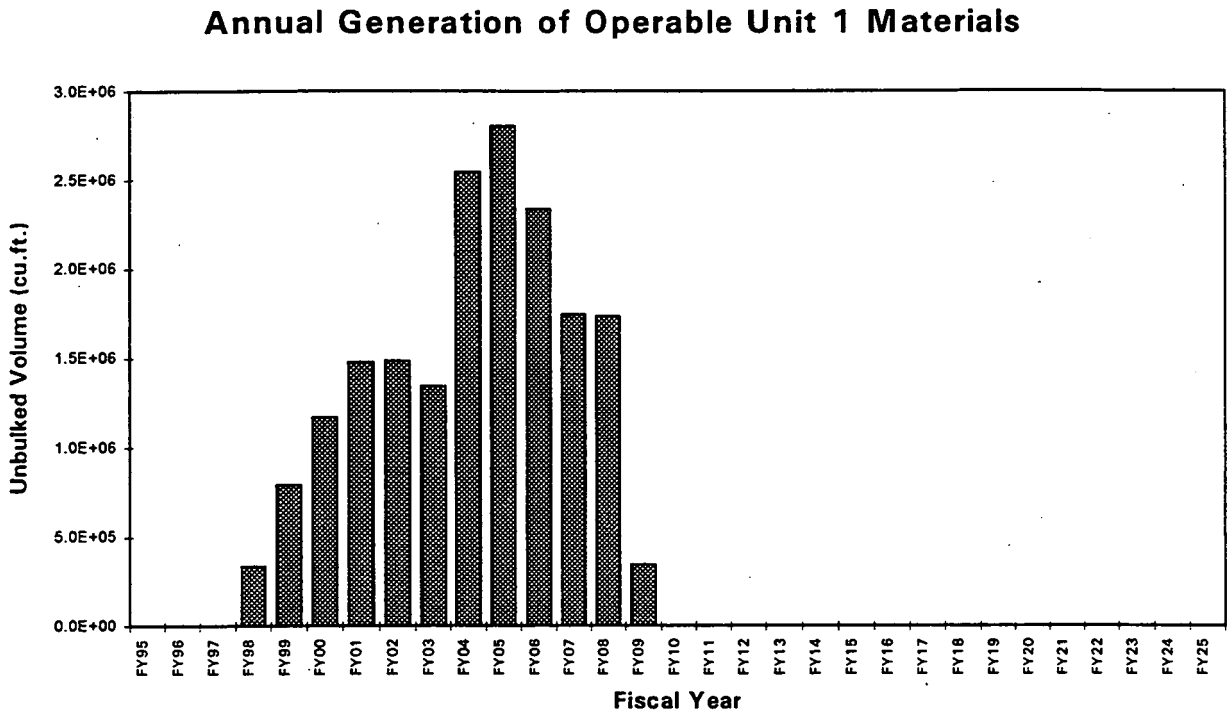


FIGURE A.2-17 Annual and Cumulative Generation of OU4 Remedial Action Materials.



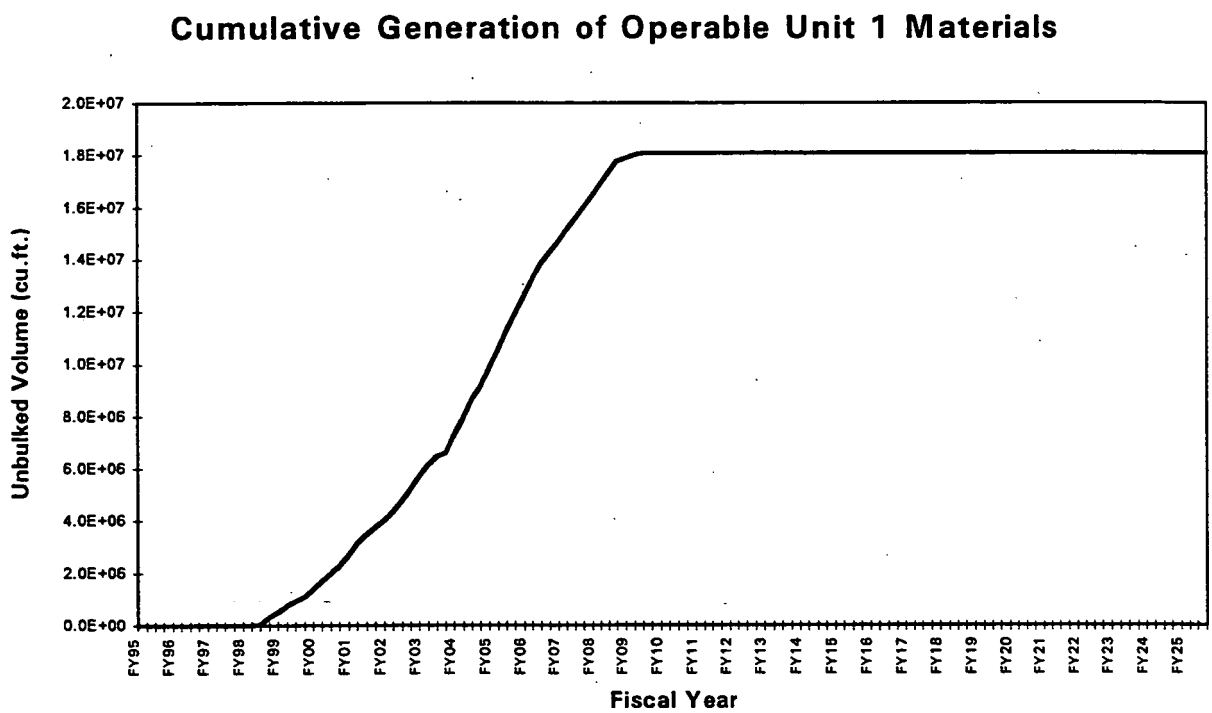


FIGURE A.2-16 Annual and Cumulative Generation of OU1 Remedial Action Materials

A.2.2 Remedial Action Materials from Other Operable Units

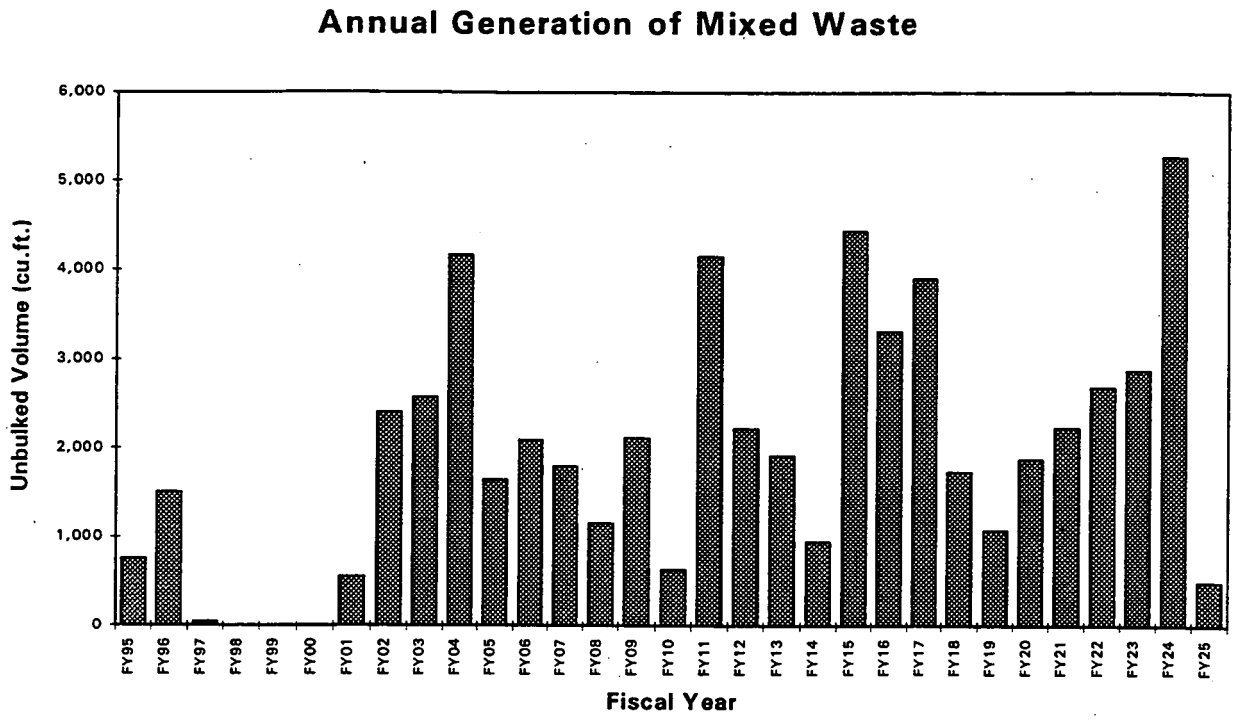
The selected remedies for other operable units, as discussed in Section 2 of the PSR, will result in the generation of additional materials that will require containerization, potential temporary storage, and disposition. The volume estimates for materials generated from the remediation of other operable units have been obtained from the August 1994 issue of the FEMP Waste Information Manual (a compilation of operable unit-specific information available at that time). The following subsections provide a brief explanation of the types and quantities of unbulked materials that will be generated from each operable unit.

Operable Unit 1
The selected remedy for OU1 identifies two material categories that will require containerization, potential temporary storage, and disposition. Approximately 6.44 million cubic feet of soil and 12.8 million cubic feet of sludge will be generated from FY-98 to FY-09 during excavation of the waste pits, Burn Pit, and Clearwell. The anticipated generation rate for OU1 materials is shown in Figure A.2-16.

Operable Unit 2
The selected remedy for OU2 identifies approximately 1.05 million cubic feet of soil, 3.38 million cubic feet of sludge (including flyash), and 2.99 million cubic feet of fill/debris will be generated from FY-97 to FY-00 during excavation of the Flyash Piles, Lime Sludge Ponds, Solid Waste Landfill, and South Field. An estimated 8,000 cubic feet of the total amount of soil (identified above) excavated from the South Field is assumed to be contaminated with lead, and will be handled as mixed waste. Since it is planned that OU2 waste will be dispositioned into the On-Property Disposal Facility upon generation, these materials will not require temporary storage. Therefore, these volume estimates do not enter into the Material Balance Model.

Operable Unit 4
The selected remedy for OU4 identifies four material categories that will require containerization, potential temporary storage, and disposition. Approximately 800,000 cubic feet of soil, 378,000 cubic feet of sludge (including Bentogrout and dry waste), 73,000 cubic feet of concrete and miscellaneous steel, and 10,000 cubic feet of equipment will be generated from FY-97 to FY-02 during remediation of the K-65 silos, Decant Sump System, and OU4 general area. The generation rates for OU4 materials are shown in Figure A.2-17.

Operable Unit 5
The preferred remedial alternative for OU5 identifies approximately 47.9 million cubic feet of soil and 1.6 million cubic feet of AWWT sludges will be generated during remediation of the FEMP environmental media. An estimated 770,000 cubic feet of the total amount of soil identified above will be handled as mixed waste. Since it is planned that OU5 material will be dispositioned into the On-Property Disposal Facility upon generation, these soils and sludges will not require temporary storage. Therefore, these volume estimates do not enter into the Material Balance Model.



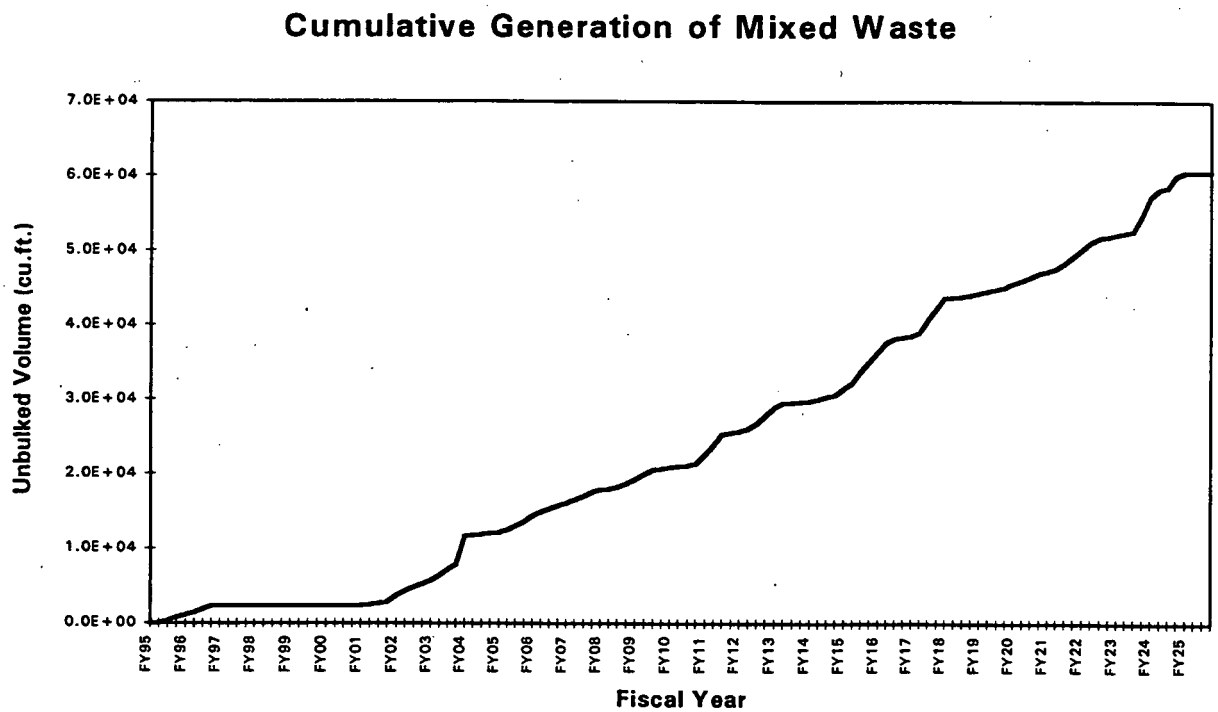
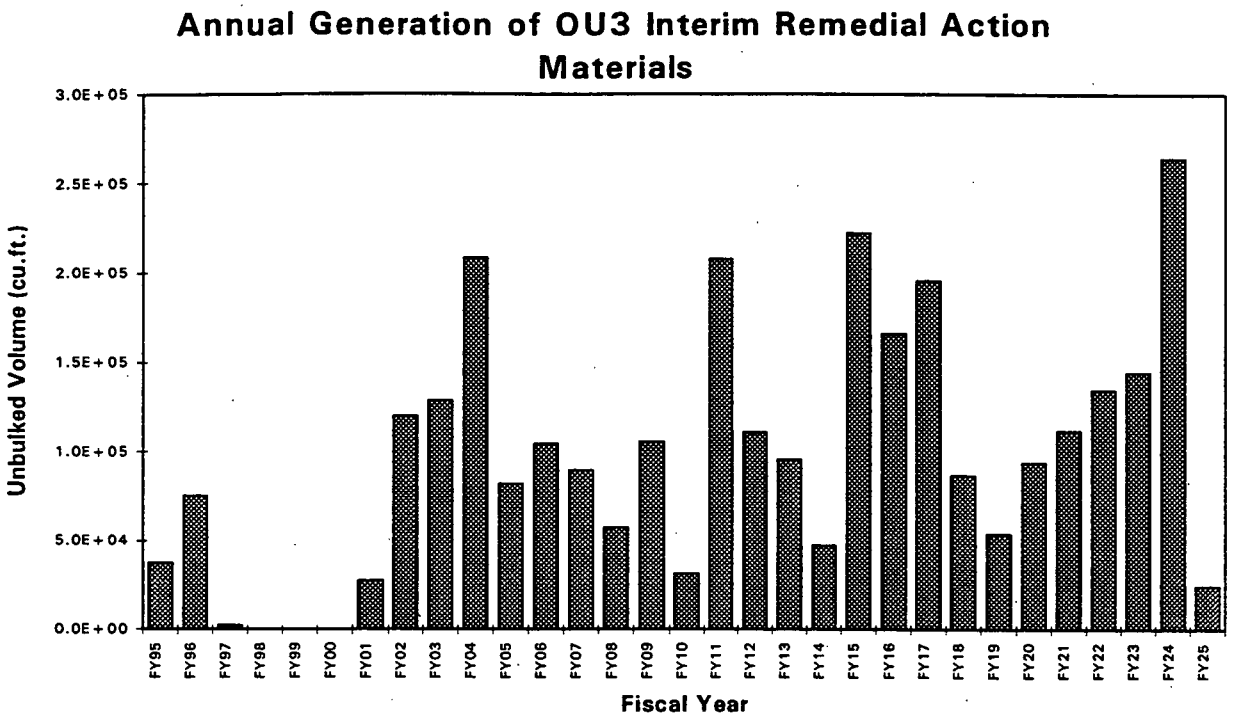


FIGURE A.2-15 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Hazardous and/or Mixed Waste



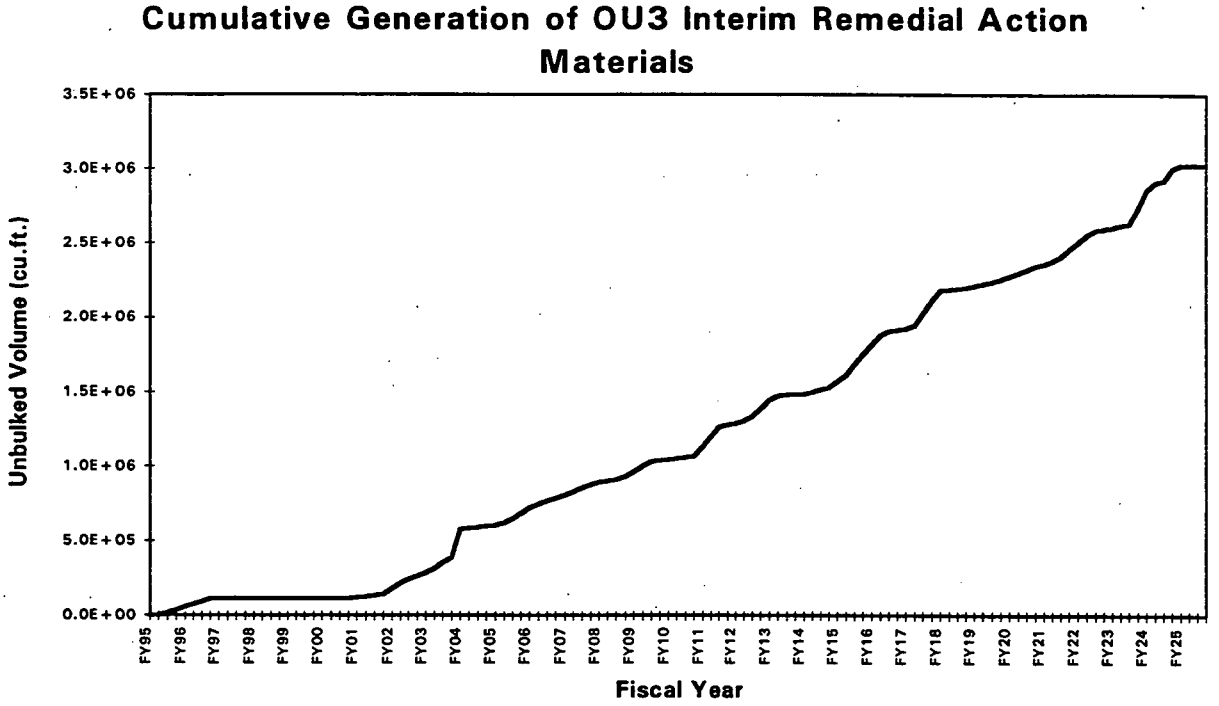
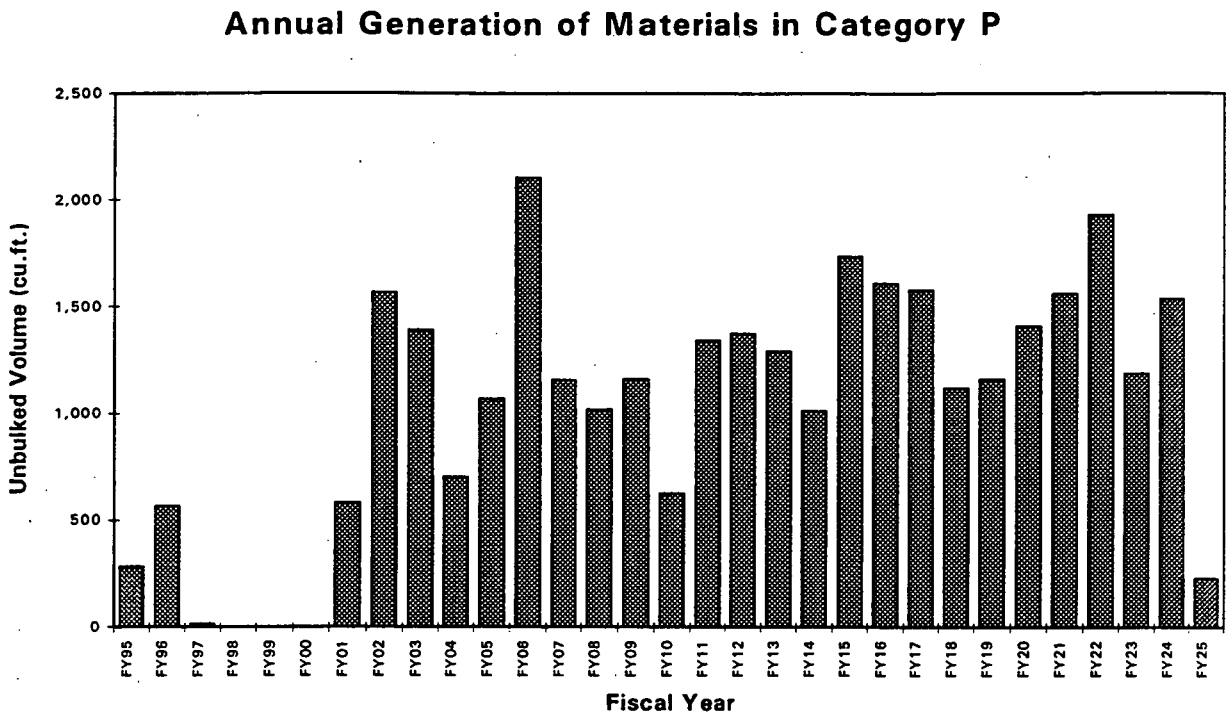


FIGURE A.2-14 Annual and Cumulative Generation of Total OU3 Interim Remedial Action Above-Grade Materials



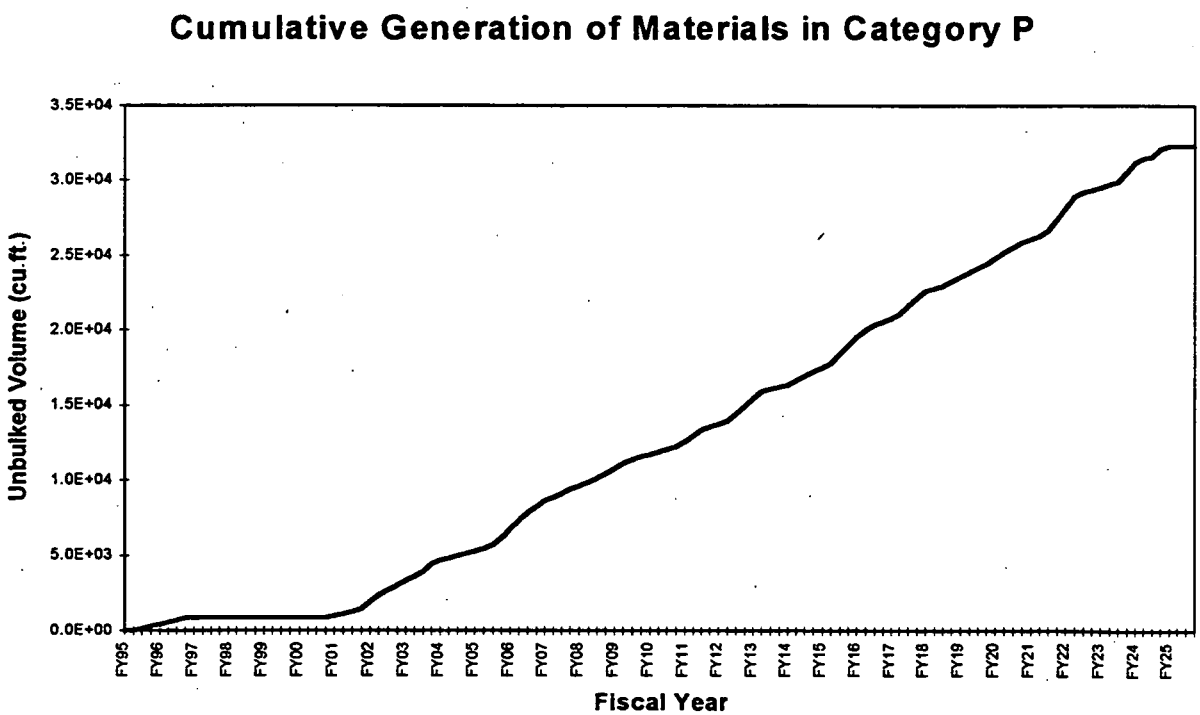
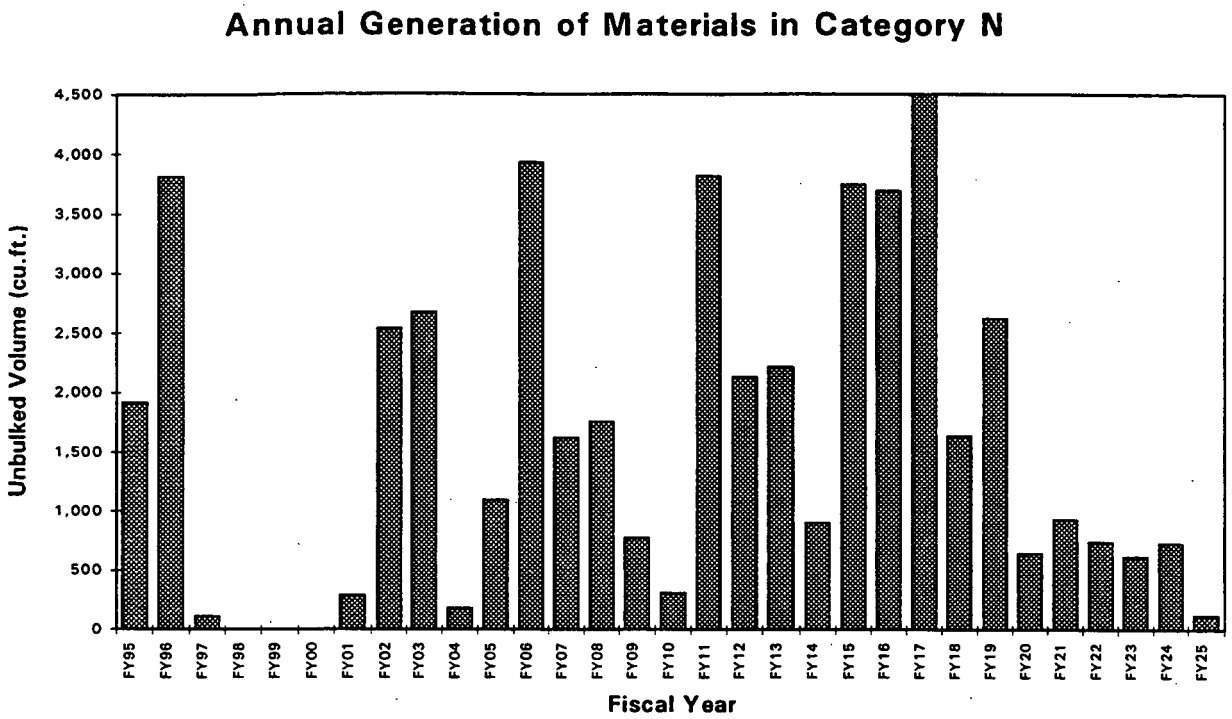


FIGURE A.2-13 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Regulated/Friable ACM (Category P)



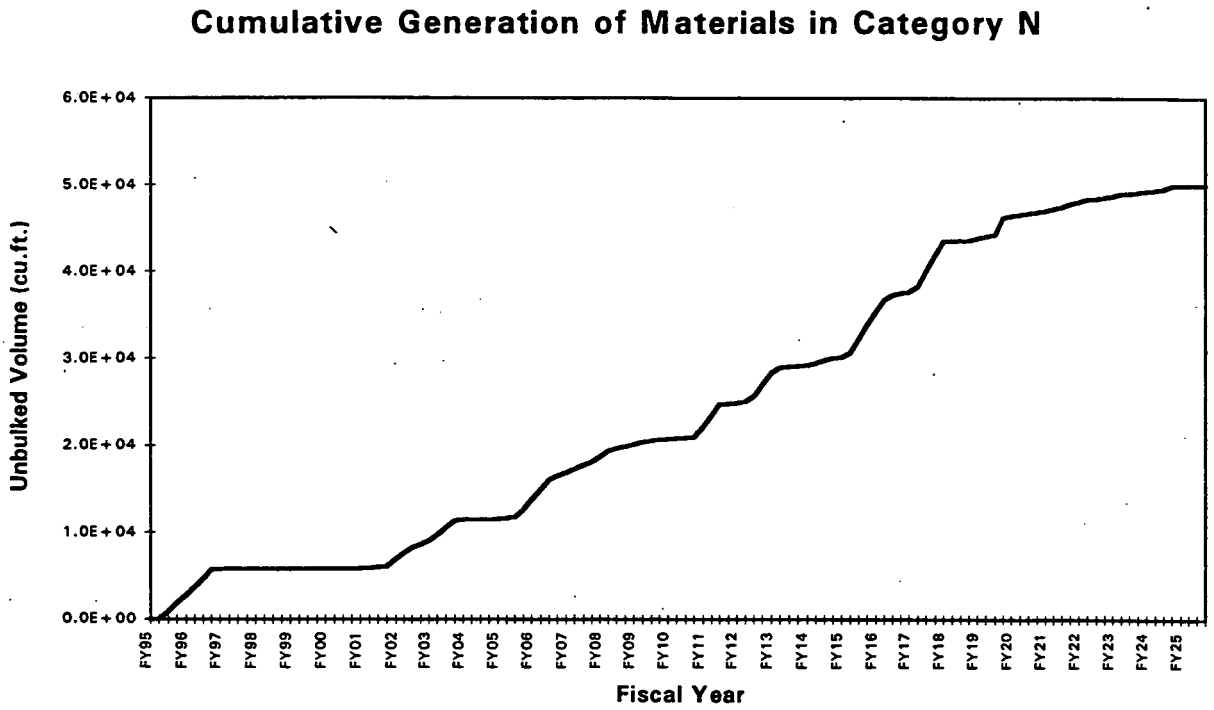
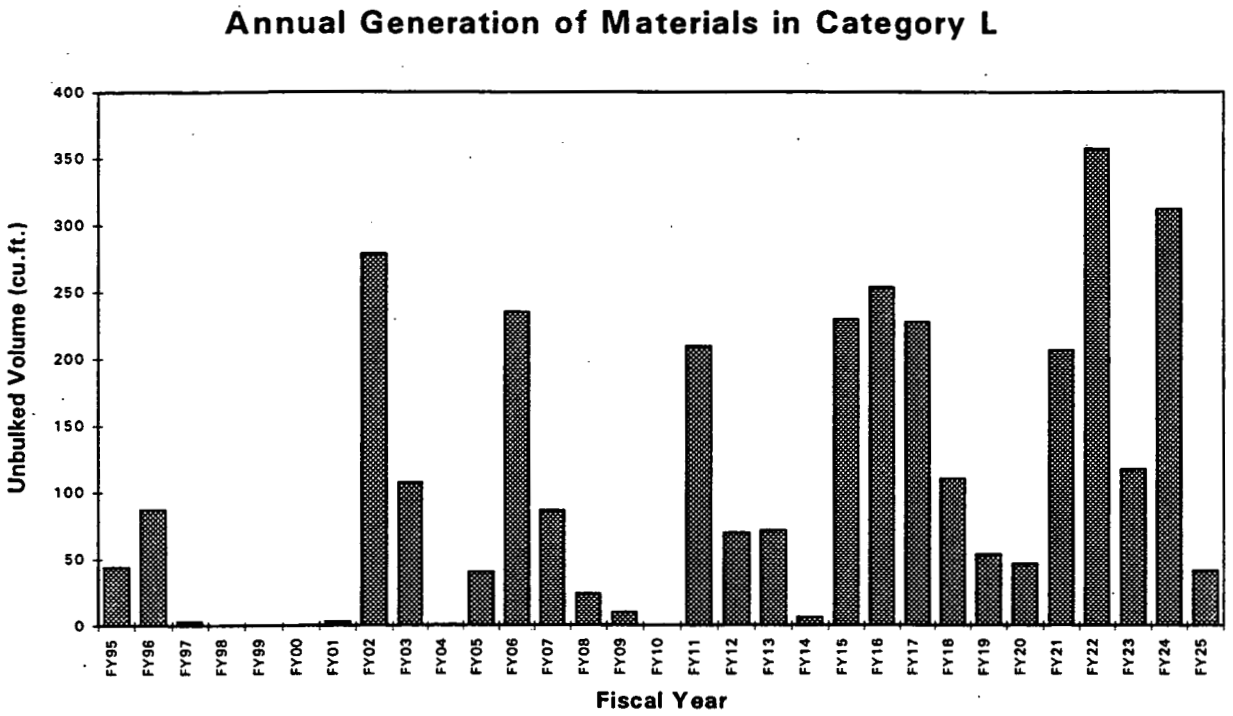


FIGURE A.2-12 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Unrestricted Use Metals (Category N)



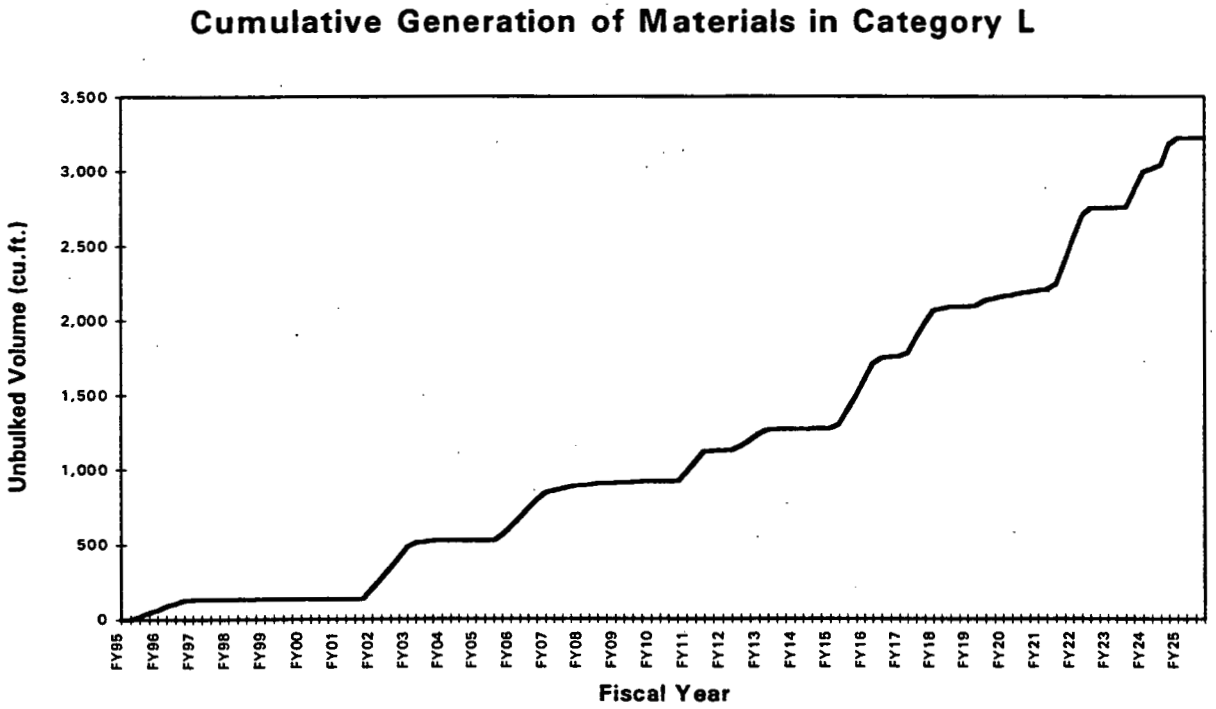
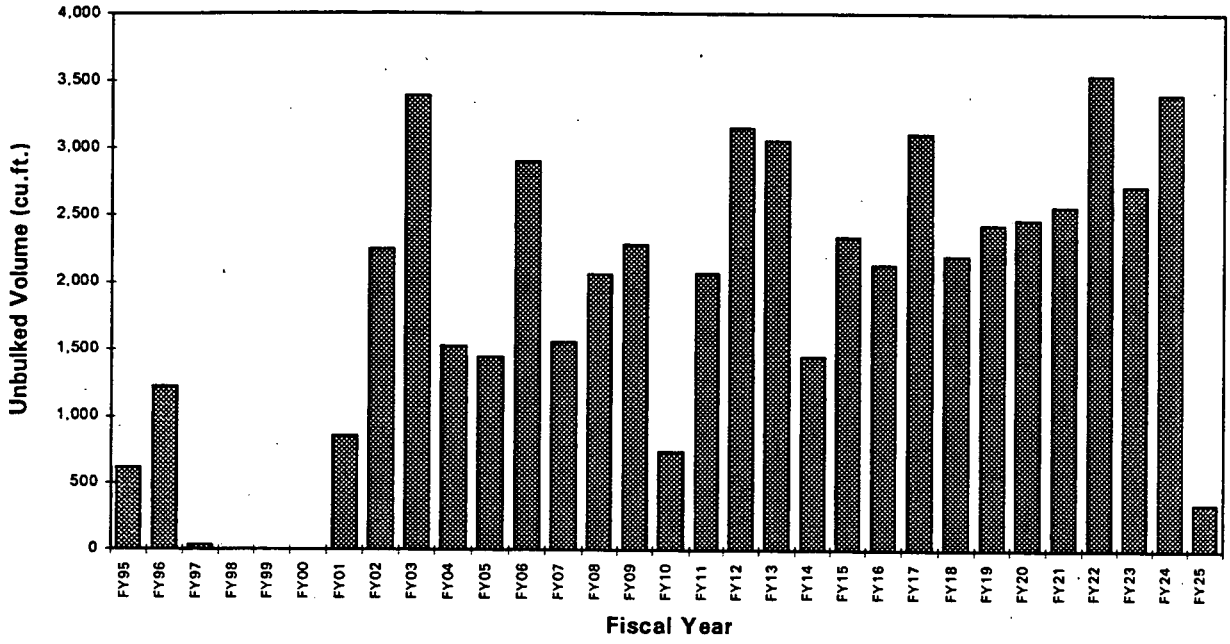


FIGURE A.2-11 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Ductwork (Category L)

Annual Generation of Materials in Category K



Cumulative Generation of Materials in Category K

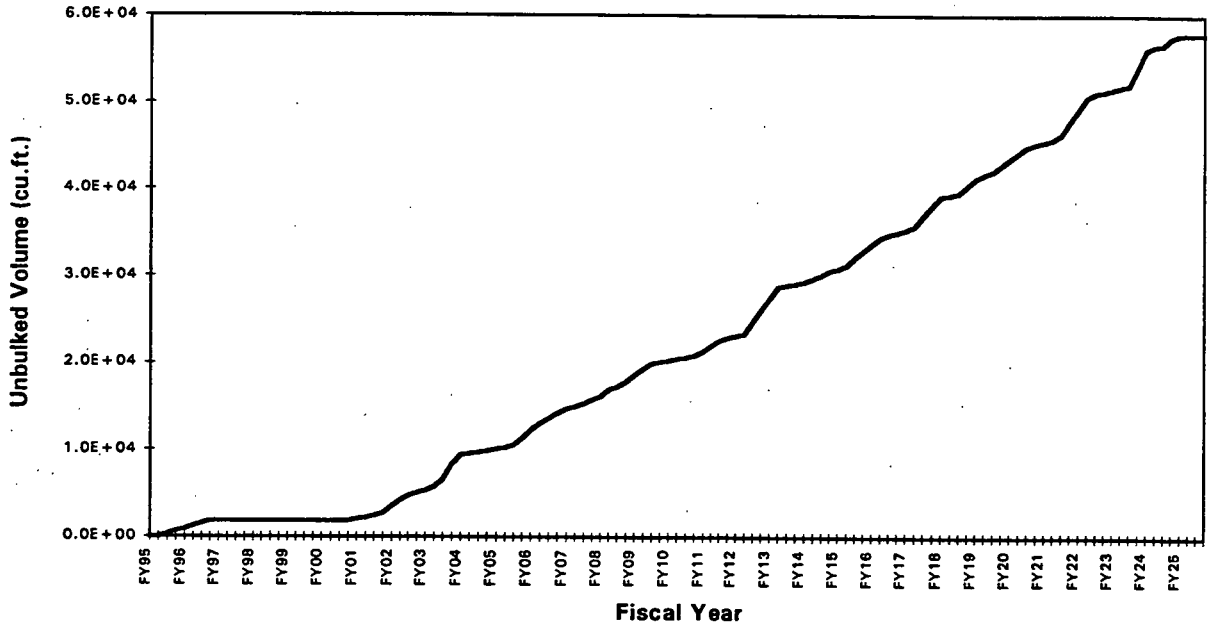
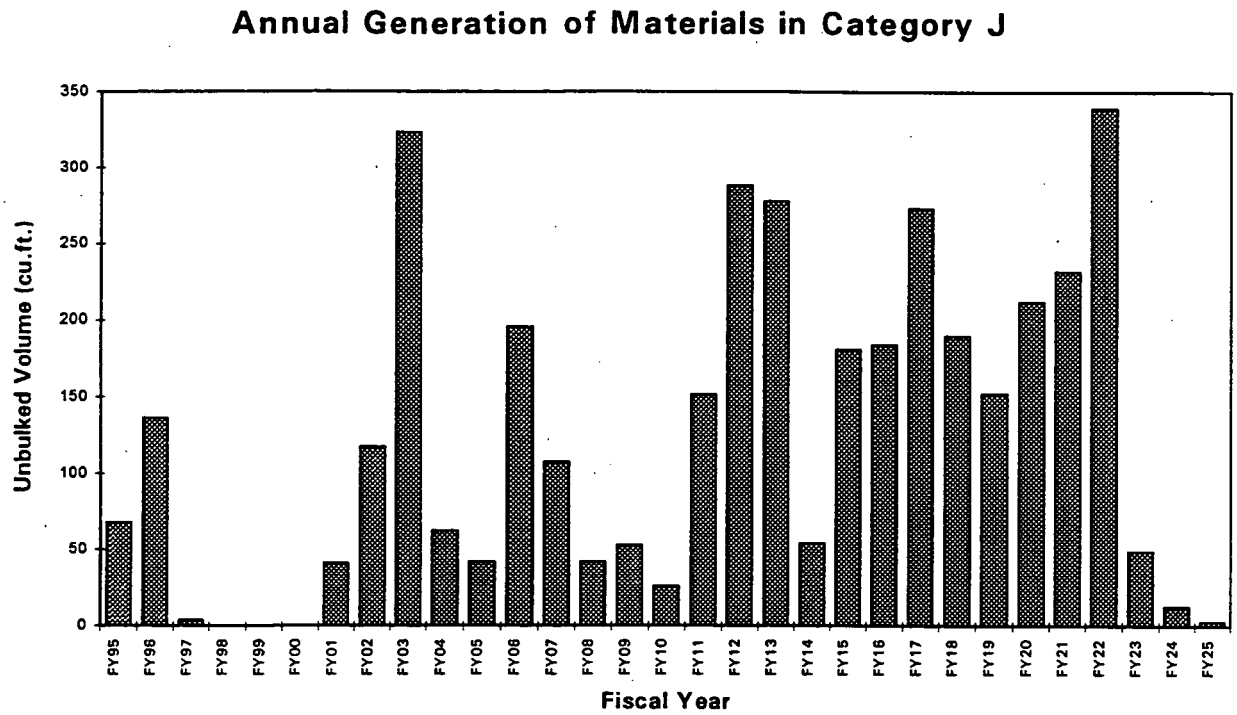


FIGURE A.2-10 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Non-Process Piping (Category K)



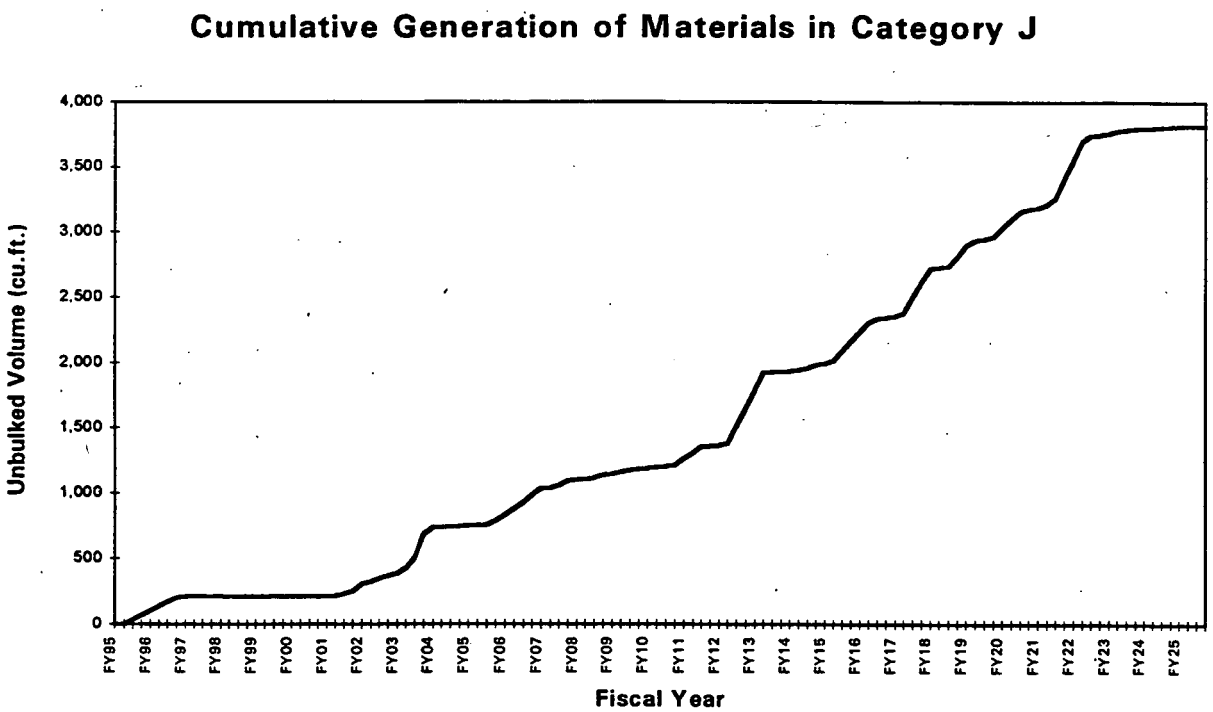
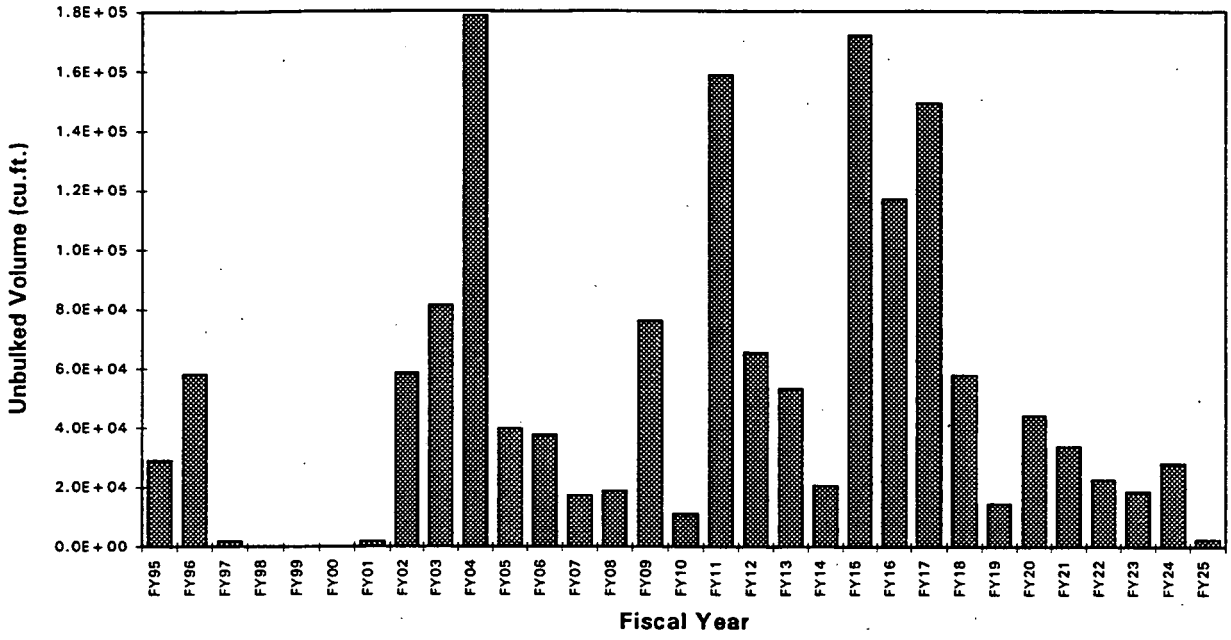


FIGURE A.2-9 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Piping (Category J)

Annual Generation of Materials in Category I



Cumulative Generation of Materials in Category I

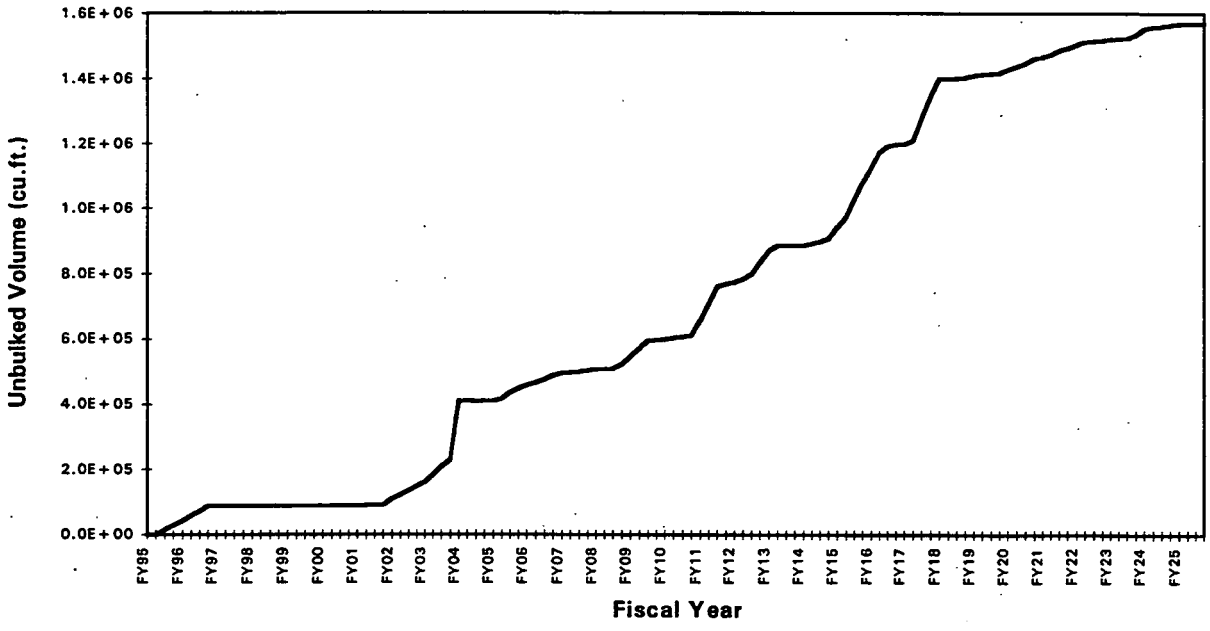
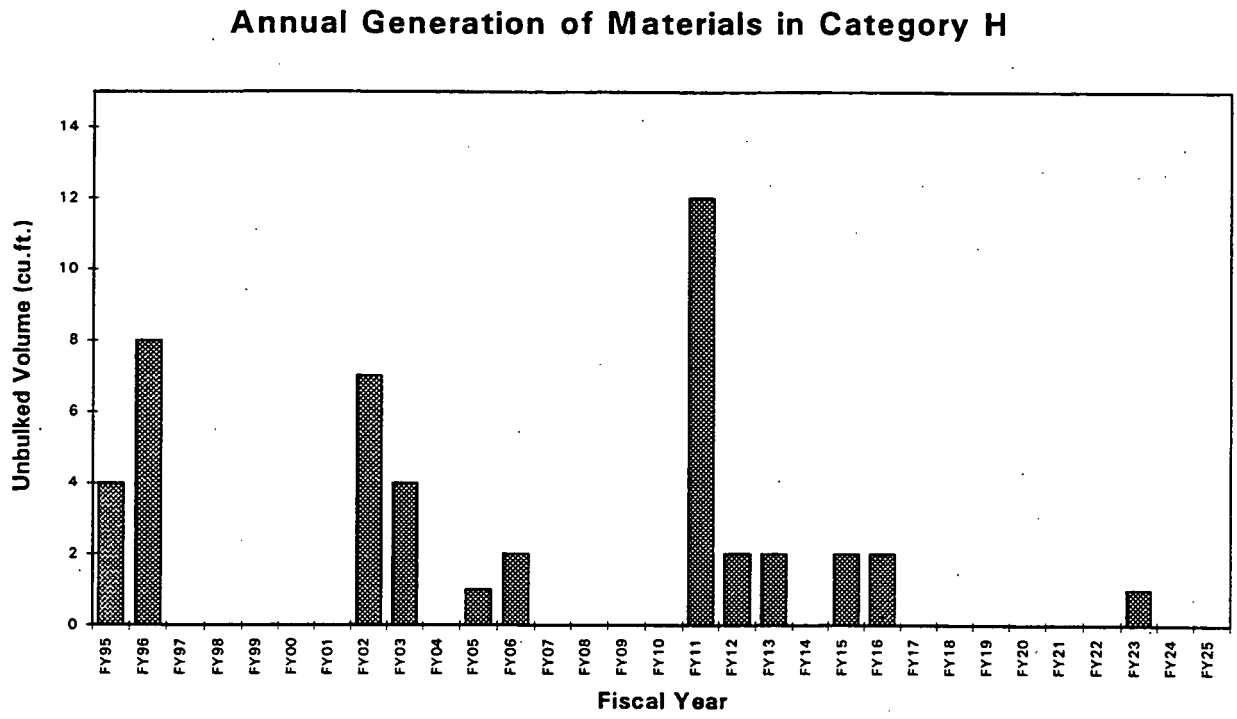


FIGURE A.2-8 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Restricted Use Metals (Category I)



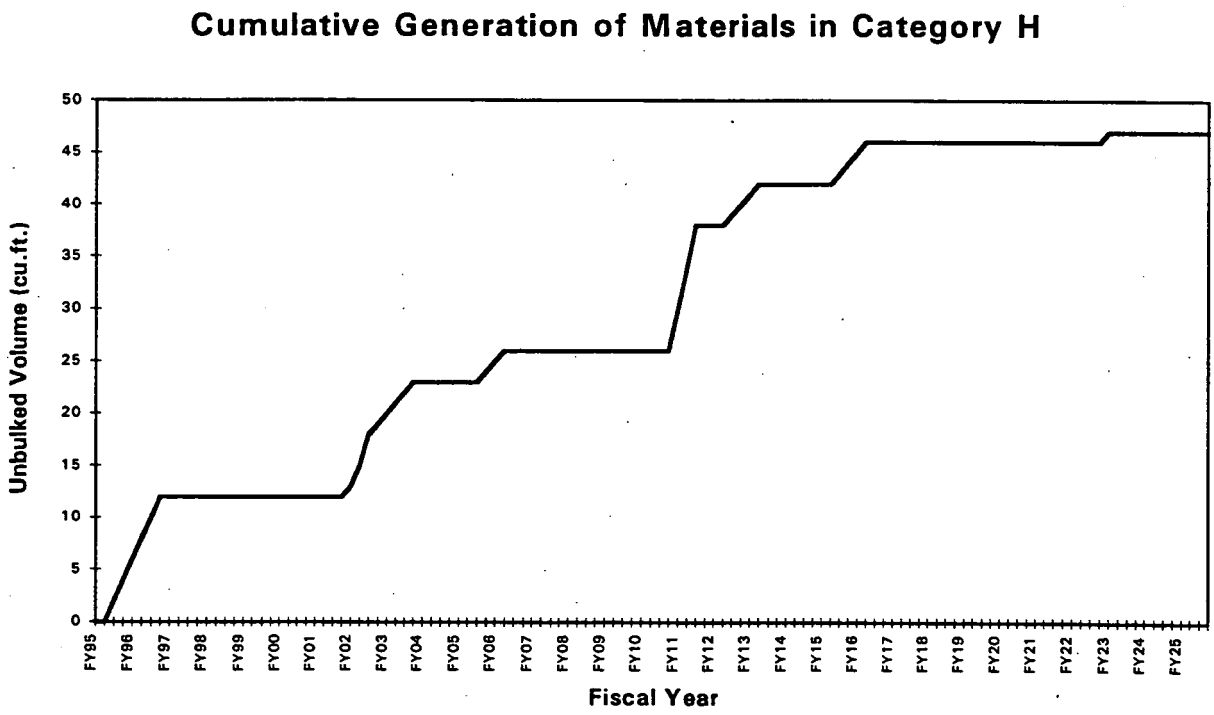
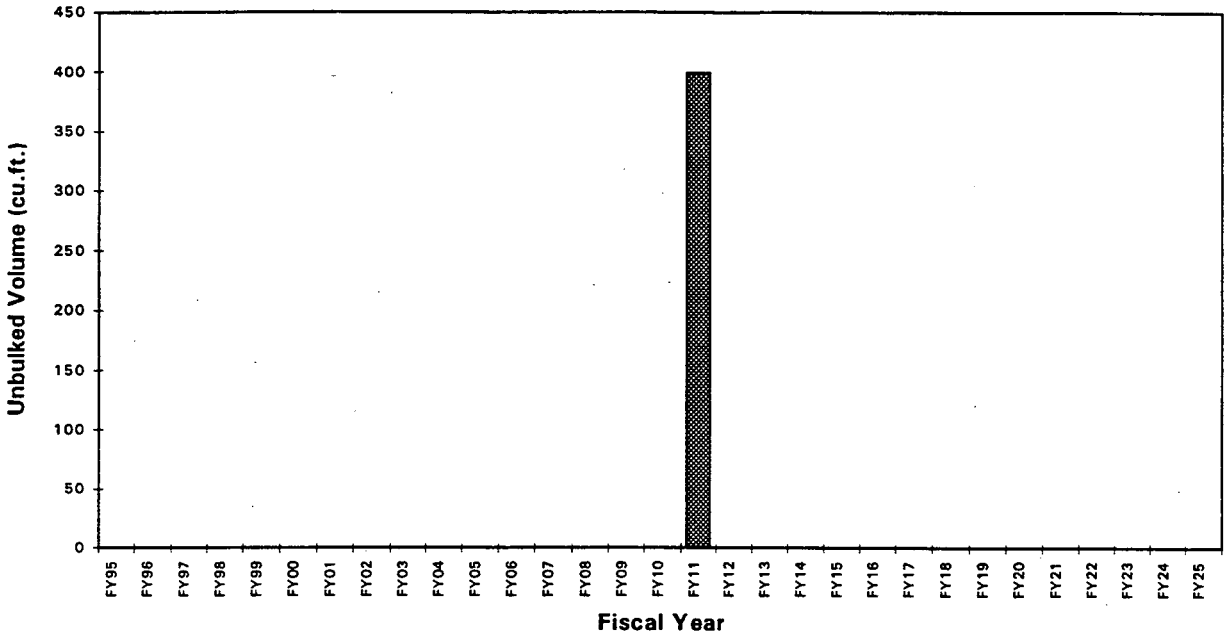


FIGURE A.2.7 Annual and Cumulative Generation of OU3 Interim Remeidal Action Above-Grade Specialty Metals (Category H)

Annual Generation of Materials in Category G



Cumulative Generation of Materials in Category G

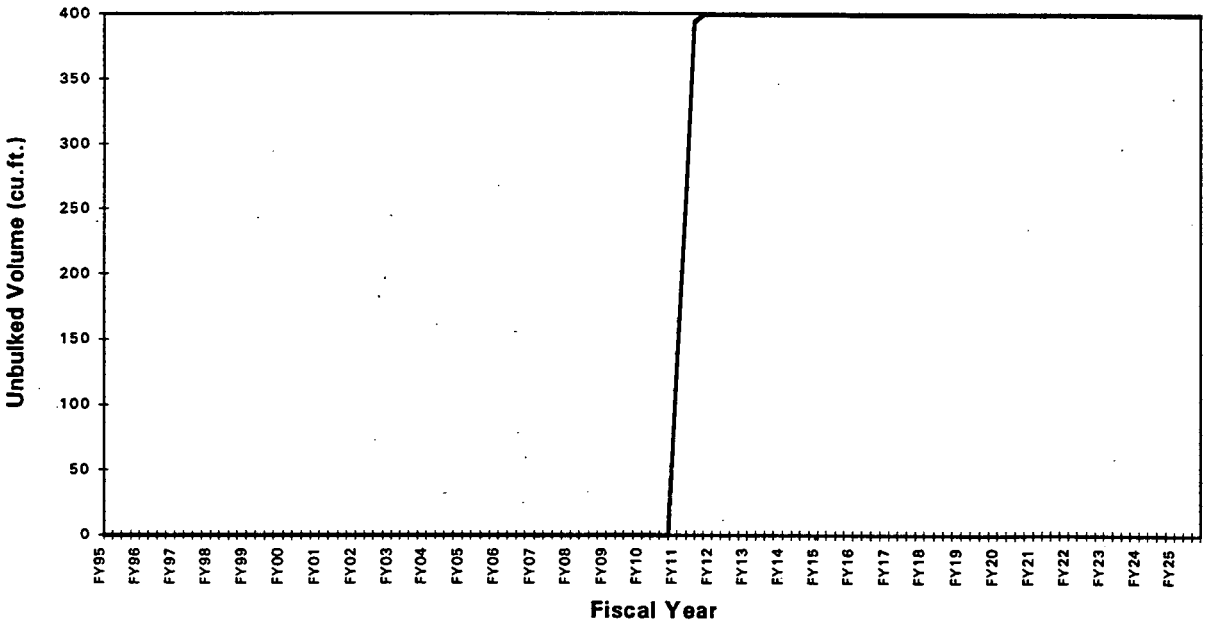
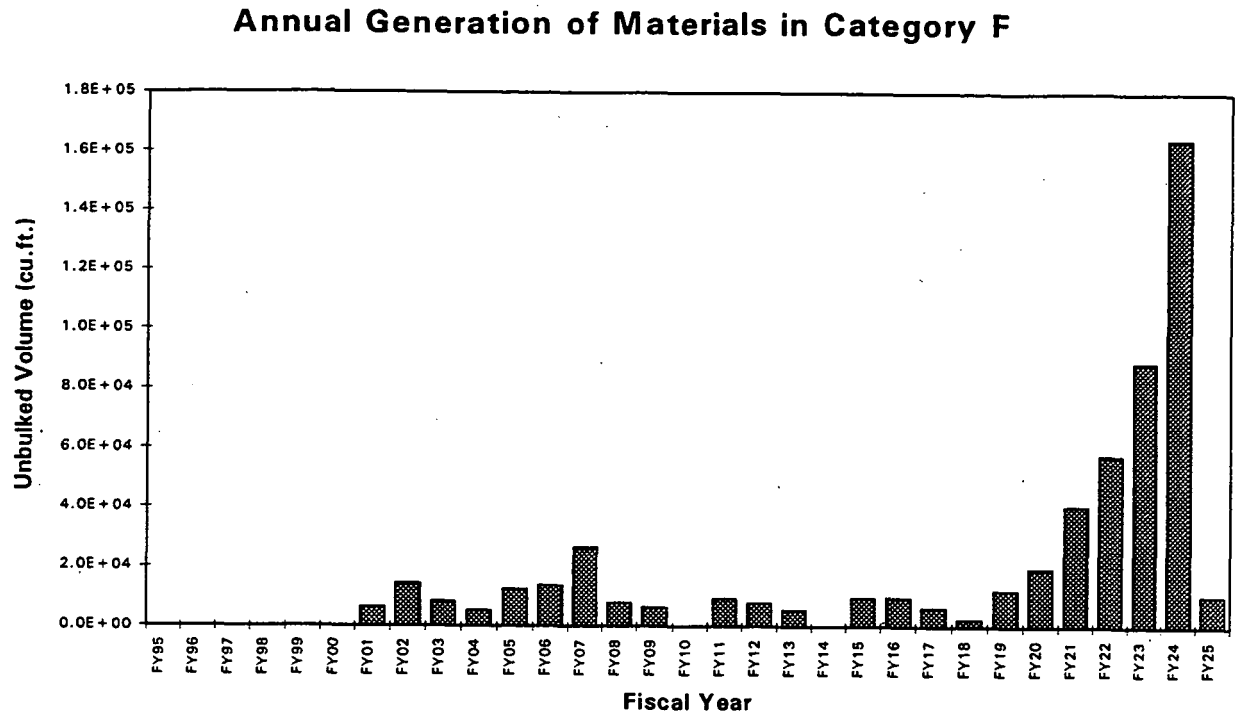


FIGURE A.2-6 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Acid Brick (Category G)



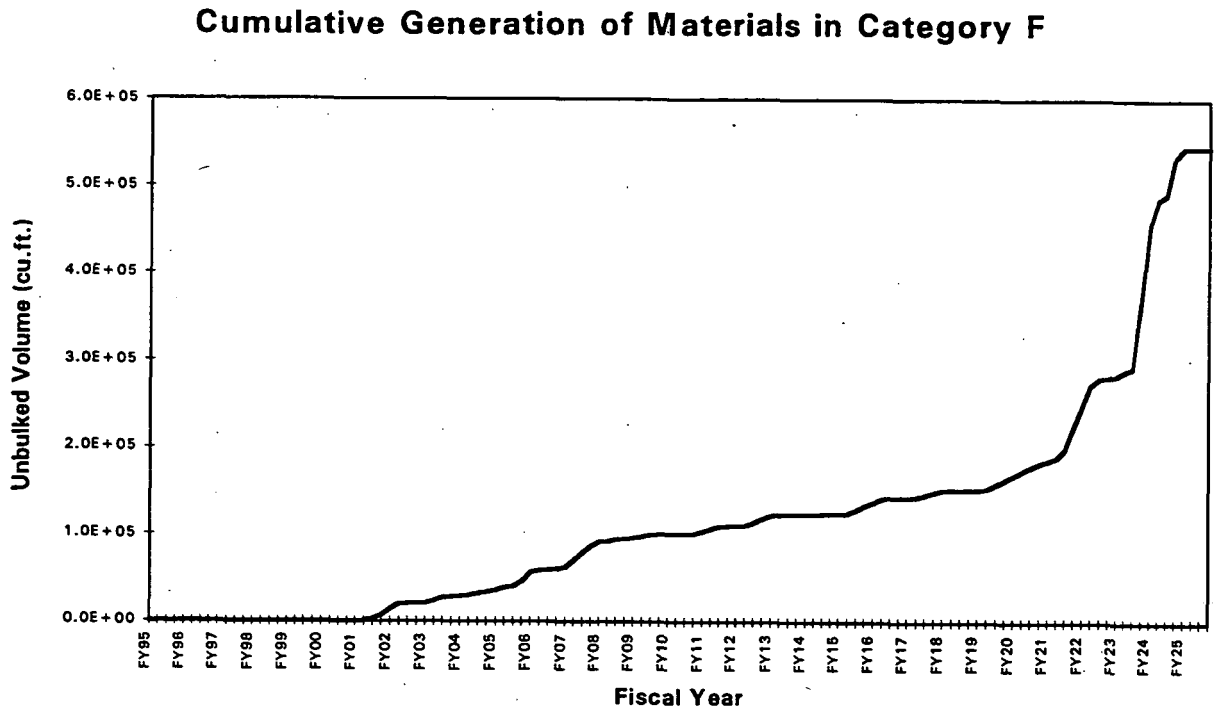
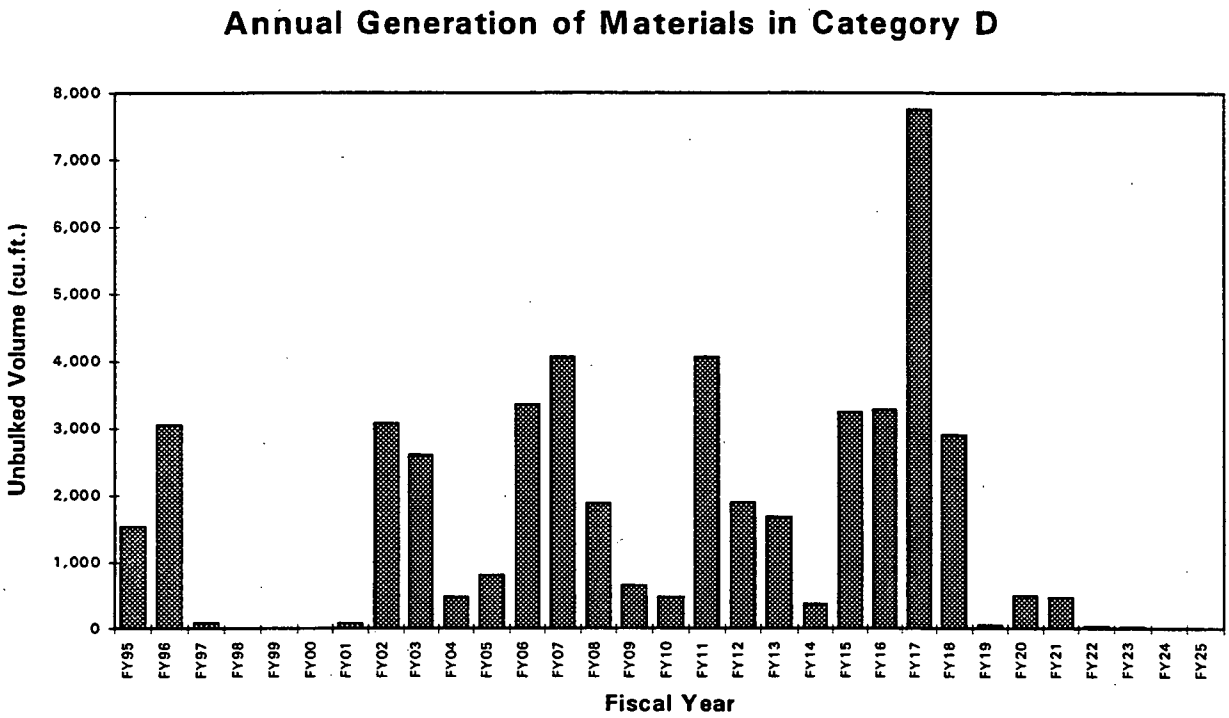


FIGURE A.2-5 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Masonry, Concrete, and Asphalt (Category F)



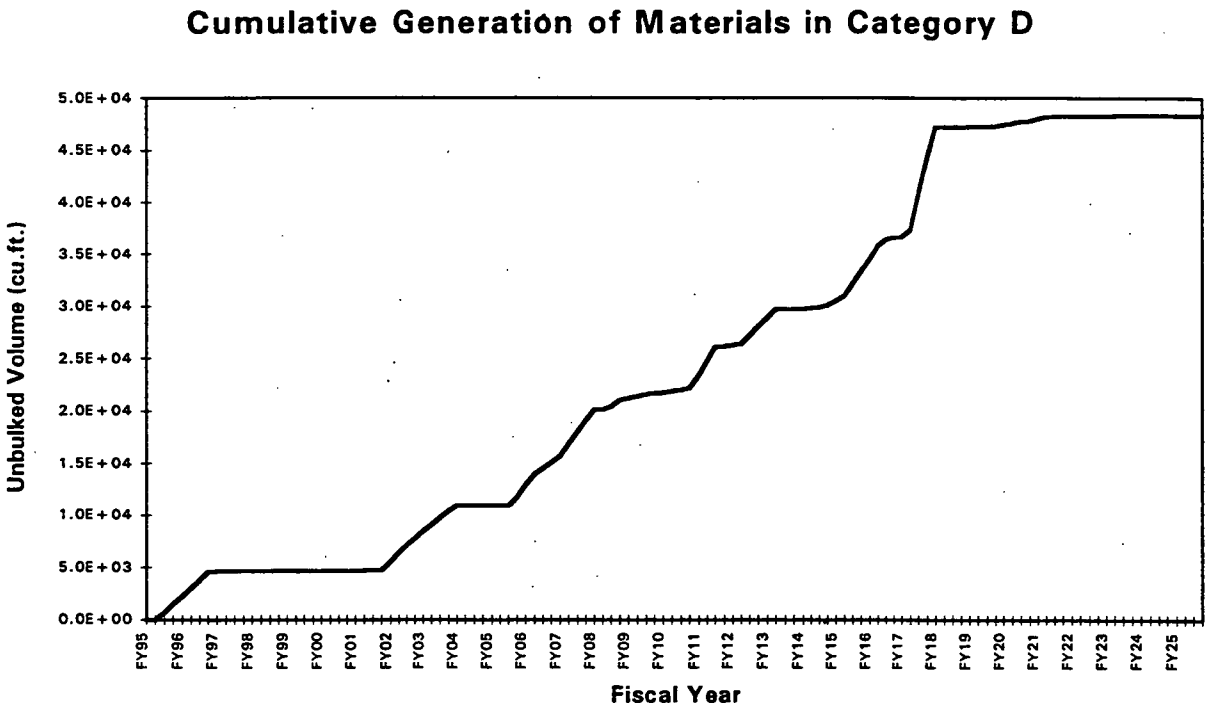
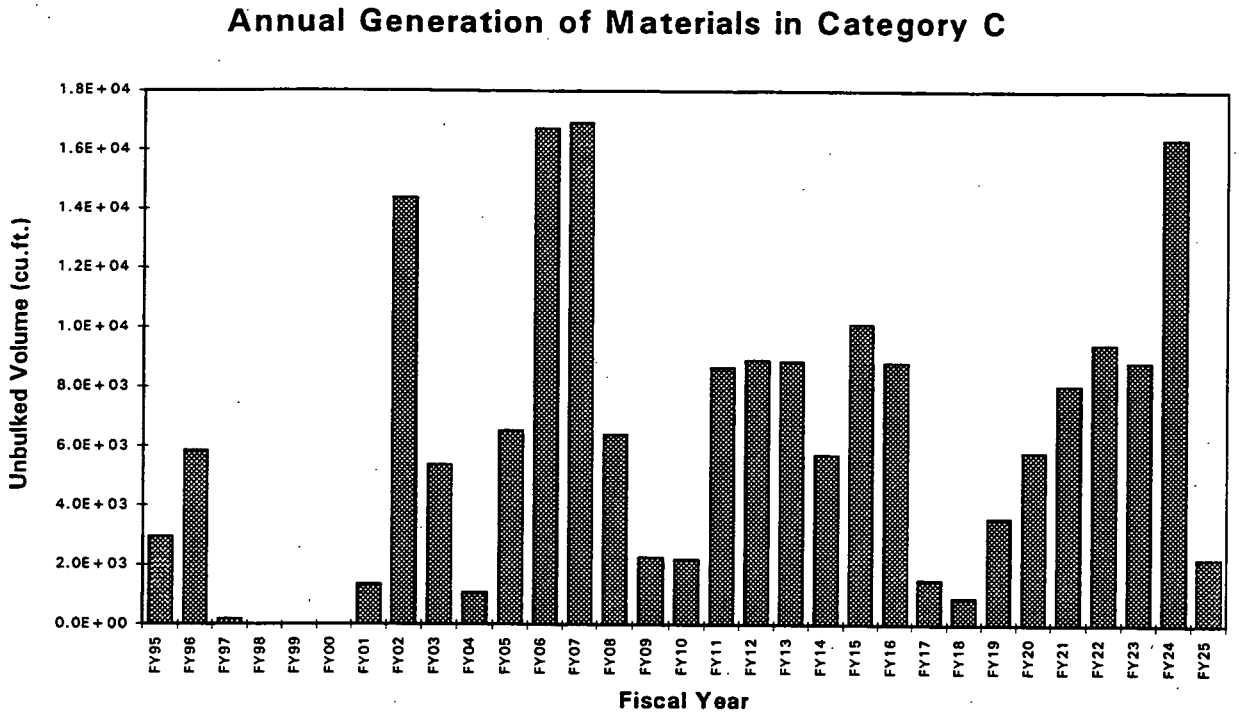


FIGURE A.2-4 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Transite (Category D)



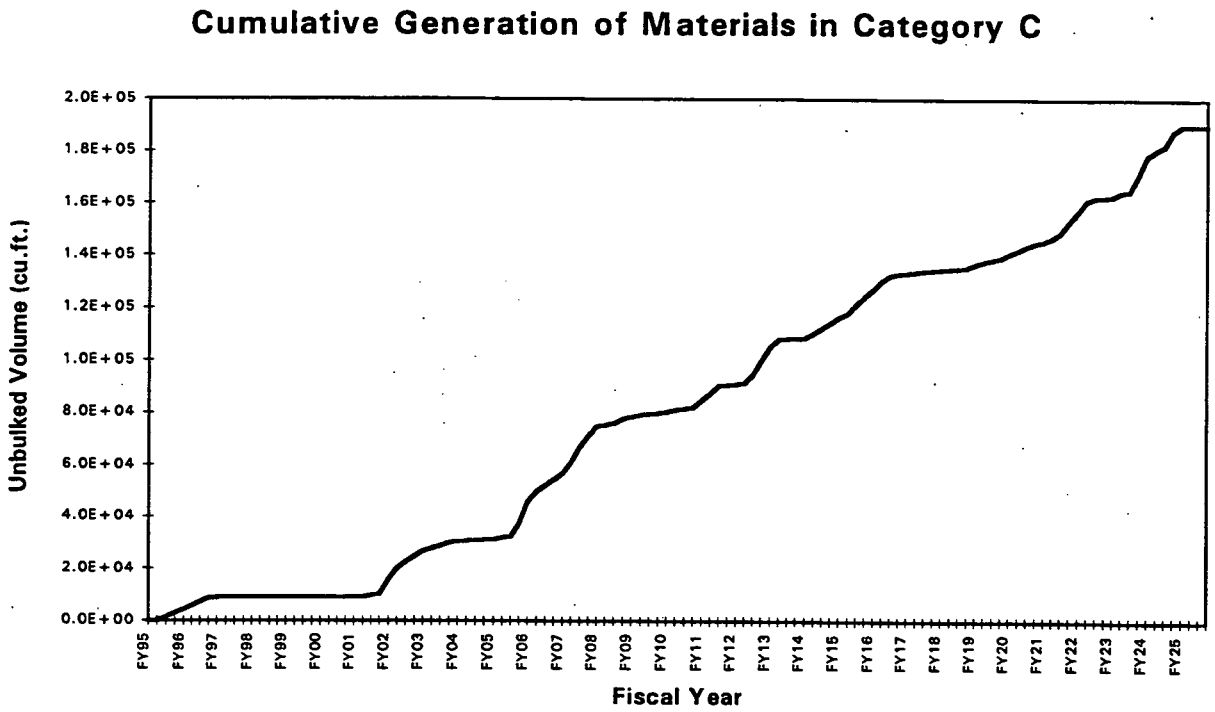
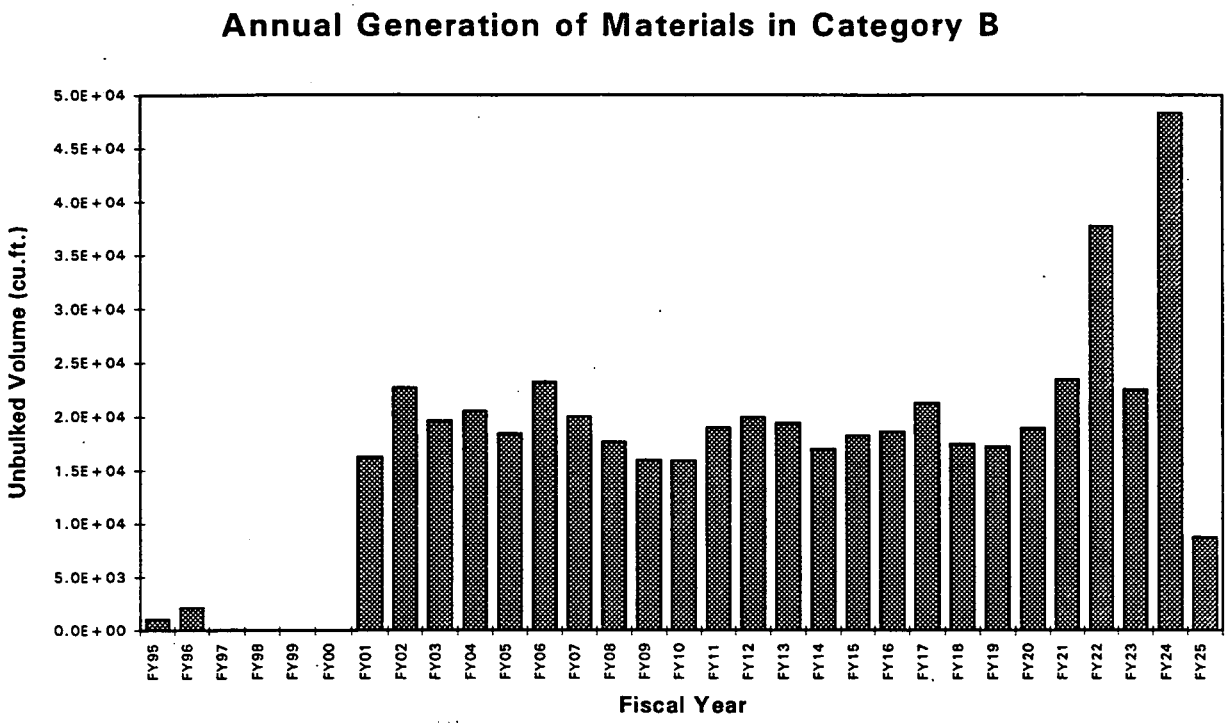


FIGURE A.2-3 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Compactible Waste (Category C)



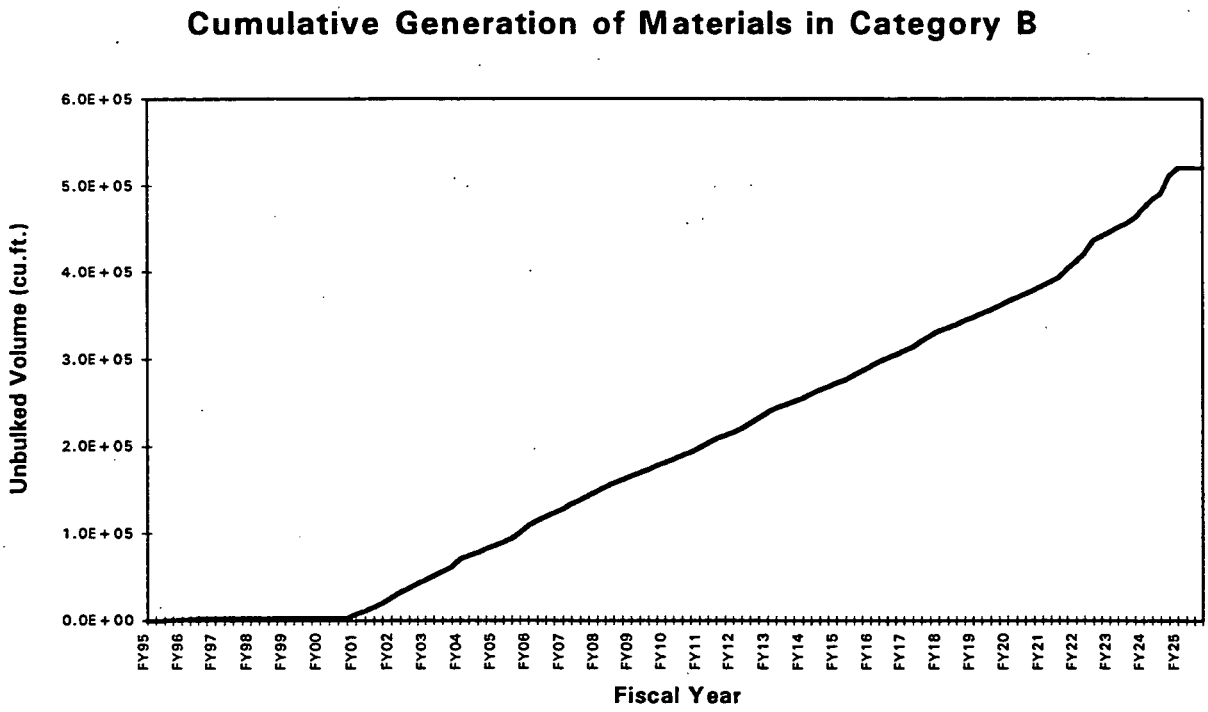
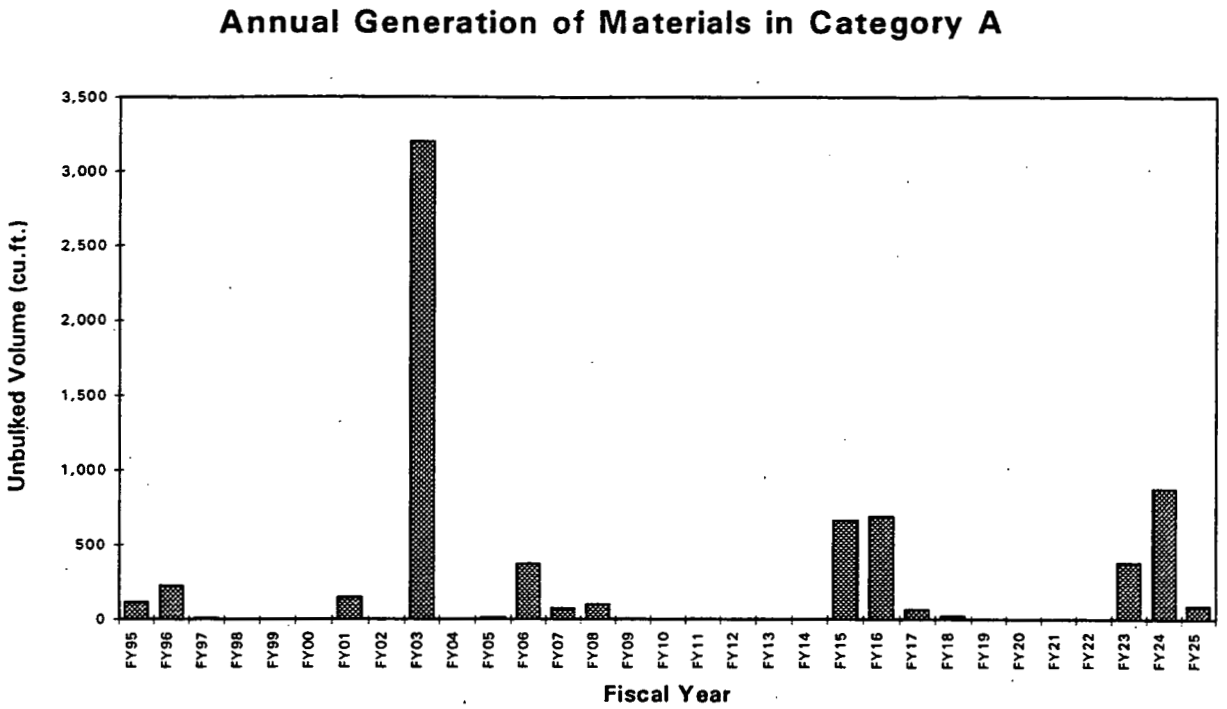


FIGURE A.2-2 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Construction Debris (Category B)



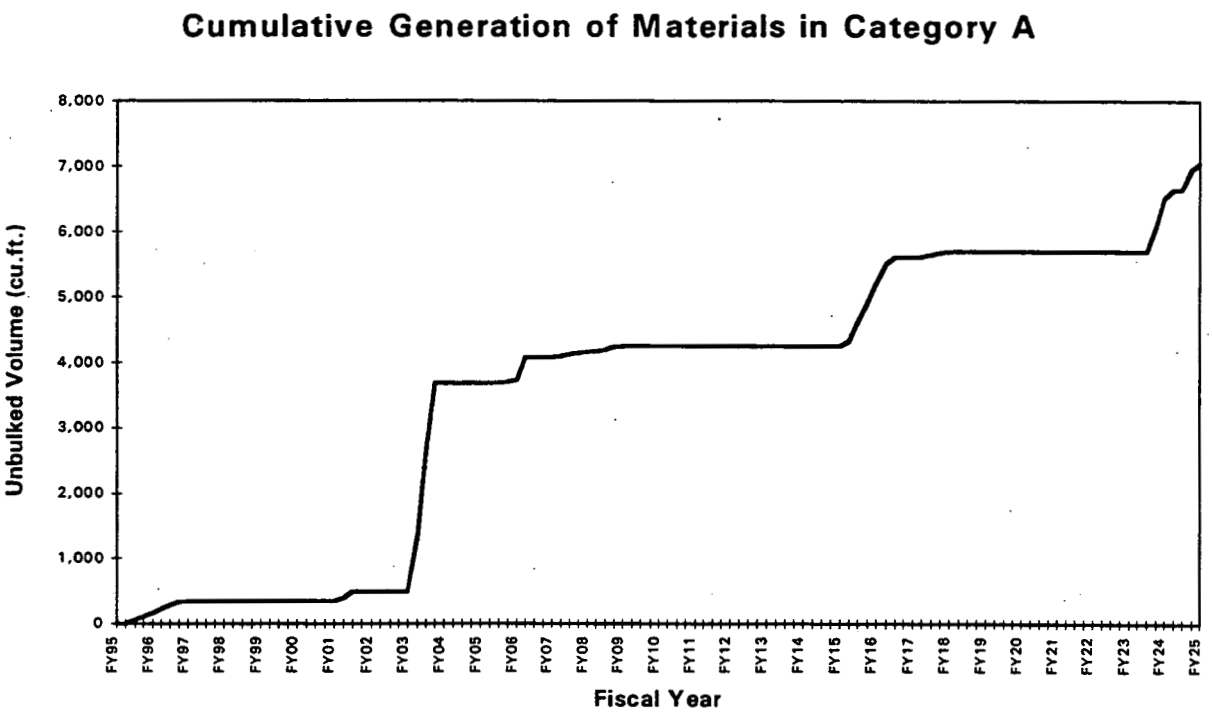


FIGURE A.2-1 Annual and Cumulative Generation of OU3 Interim Remedial Action Above-Grade Non-Regulated ACM (Category A)

The generation rate for material from the OU3 interim remedial action is dependent on the base schedule for the remediation of complexes. Utilizing the base schedule that is presented in Figure 4-3 of the PSR and the material volume estimates for the OU3 components, the anticipated material generation rate for each category of materials is presented in Figures A.2-1 through A.2-13. The anticipated total generation rate for OU3 interim remedial action materials is presented in Figure A.2-14, and the anticipated generation rate for the portion of the total OU3 material that is assumed to be hazardous and/or mixed waste is presented in Figure A.2-15. Note that the ordinate scale of each graph has been chosen to best utilize the available graph space.

Because the Miscellaneous Complex is expected to be remediated over the course of the OU3 interim action and does not have a distinct duration or schedule, the generation rate for these materials is assumed, for the purposes of the Material Balance Model, to be linear with material generation starting at the same time as the External Complex and finishing with the Administration Complex.

The spike shown in Figure A.2-1 represents the removal of 3,200 cubic feet of non-regulated, non-friable ACM (Category A) from the above-grade portion of the Boiler Plant (10A) in FY-03. Also, the spike shown in FY-11 in Figure A.2-6 of 400 cubic feet of acid brick (Category G) is attributed to the above-grade dismantlement of the Ore Refinery Plant (2A), which is the only OU3 component with a significant quantity of above-grade acid brick.

TABLE A.2-1 OU3 Interim Remedial Action Material Volume Estimates

OU3 RD/RA Category	Material Types	At-/Below-Grade Unbulked Volume (ft^3)[1]	Above-Grade Unbulked Volume (ft^3)
A	Non-Regulated/Non-Friable Asbestos-Containing Materials (ACM) (includes floor tile, fire brick, gasket material, and feeder cable)	3,400	7,100
B	Construction Debris (includes general refuse, ceiling material, built-up roofing/substrate, doors, windows, HEPA filters, and wood)	27,400	520,400
C	Compactible Waste (includes PPE and fiberglass insulation)	0	189,600
D	Transite (includes wall panels and roof panels)	0	48,400
E	Residues, Hold-Up Material, and Sludges	N/A [2]	N/A [2]
F	Masonry, Concrete, Asphalt	3,948,800	545,400
G	Acid Brick	20,300	400
H	Specialty Metals (includes nickel, copper, inconel, monel, stainless, and lead flashing)	0	100
I	Restricted Use Metals (includes equipment, roll-up/overhead doors, miscellaneous electrical components, metal wall panels, metal roof panels, louvers, and insulated wire with conduit)	200	1,568,100
J	Process Piping	14,000	3,800
K	Non-Process Piping	42,800	57,800
L	Ductwork	0	3,200
M	Furnaces and Dissociators	N/A [3]	N/A [3]
N	Unrestricted Use Metals (includes structural steel and decking)	9,700	49,500
P	Regulated/Friable ACM (thermal system insulation)	0	32,200
Q	Decontamination Wash Waters	N/A[4]	N/A [4]
R	Soils	N/A[5]	0
Total OU3 Interim Remedial Action Material Volume		4,066,600	3,026,000

N/A = Not Applicable

(1) At- and below-grade volume estimates are not included in the Material Balance Model but are provided for information only.

(2) Category E (residues, hold-up material, and sludges) has not been estimated in this table but will be accounted for under the Removal No. 12 estimated volumes (discussed in Section A.2.3).

(3) Category M (furnaces and dissociators) estimates are included with Category I.

(4) Category Q (decontamination wash waters) are not included in the Material Balance Model because they are liquids intended for near-term processing (sludges resulting from treatment and filtration will be included in Category E).

(5) Category R (soils) quantities are considered to be part of OU5 generation terms and will be handled as part of at- and below-grade remediation (discussed in Section A.2.2). Volumes of soil have not been quantified.

A.2 Projected Material Streams and Volume Estimates

Material generation has been determined by identifying the various types of material streams that require similar storage and their respective volume estimates. Volume estimates were derived from projected generation rates for each complex being remediated under the OU3 interim remedial action, remedial actions of other operable units, removal actions, and other on-going projects at the FEMP.

The material volumes are presented in the following subsections as unbulked volumes. Bulking factors, which are used to quantify material volumes for estimating storage capacities, will be applied in Section A.3. Bulked volumes will then be used through the remainder of this appendix.

A.2.1 OU3 Interim Remedial Action Materials

The decontamination and dismantlement of OU3 components will result in the generation of many different types of material from above- and at-/below-grade that require containerization, temporary storage, and disposition. The Material Balance Model groups material into categories according to similar disposition and containerization requirements, as presented in Appendix A of the OU3 RD/RA Work Plan. The resulting seventeen OU3 RD/RA material categories are listed in Table A.2-1 along with their respective above-grade and at-/below-grade unbulked volume estimates. Above-grade estimates are listed separately from at-/below-grade estimates since OU5 will generate at-/below-grade material at a rate (to be determined by the OU5 remedial action schedule) that will not require temporary storage but, rather, be dispositioned directly into the On-Property Disposal Facility. Since at- and below-grade materials will not require temporary storage, those volume estimates are not represented in the Material Balance Model but are accounted for in Table A.2-1 for information only. It should be noted that the RD/RA material categories listed in Table A.2-1 will be superseded by the material classification system developed for the OU3 RI/FS Report, which is planned for USEPA/OEPA submittal in September 1995.

Prior to the development of the OU3 RI/FS Report, the OU3 RD/RA material segregation categories cannot include segregation based on level and type of contaminant. However, it is important to estimate the amount of hazardous and/or mixed waste that will be generated during the OU3 interim remedial action because of the potential impacts of the base schedule to storage and disposition of hazardous and/or mixed wastes. Therefore, until the OU3 field characterization data can be assessed in the OU3 RI/FS Report, the Material Balance Model will use the assumption that two percent of the total OU3 material volume will be hazardous and/or mixed waste. This assumption is considered to be conservative because the areas within OU3 that are considered to have the highest levels of hazardous contaminants have been identified as HWMUs and many of the HWMU closures will have been completed before dismantlement activities commence within the component. Two percent of the total OU3 above-grade and at-/below-grade material volumes amount to approximately 60,500 and 81,300 cubic feet (unbulked) of hazardous and/or mixed wastes, respectively.

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Material Balance Model uses the assumption that unrestricted use bulk metals, such as structural steel, will be recycled at the end of dismantlement activities per complex.

The term On-Property Disposal relates to the On-Property Disposal Facility that is discussed in the OU2 Feasibility Study (FS) Report, which projects that the On-Property Disposal Facility will begin receiving wastes for burial as early as August 1997 and provides the best estimate for rate of material burial. Section A.3 elaborates further on both on-property and off-property disposition and provides the necessary information required to calculate both the Off-Property Disposition and On-Property Disposition terms of the mass balance equation.

By using the estimated values in the mass balance equation, the difference between material generation and material disposition equals the amount of material that requires temporary storage at any point during the project. As discussed in Section A.4, storage is categorized into three types: hazardous and mixed waste storage; non-RCRA covered storage (for sludges and inventory product residues); and uncovered storage (all other LLW or nuclear product). By comparing the need for these types of temporary storage (Section A.4) with the maximum on-property storage capacities (Section A.5), the resulting material balance determination will indicate whether or not there is a need to provide for additional temporary storage facilities during specific periods of time.

A summary of the results of the Material Balance Model is discussed in Section A.6 and will be factored into Section 6.0 of the PSR.

years. Therefore, a total of 125,000 cubic yards of remediation material is assumed to be dispositioned in the On-Property Disposal Facility each year.

The first material is anticipated to be dispositioned in the On-Property Disposal Facility by August 1997 and will primarily consist of OU2 and OU5 materials. It is assumed that the On-Property Disposal Facility can begin accepting other materials (e.g., OU3 interim remedial action material, OU1 and OU4 remedial action materials, etc.) by August 1998. Figure A.3-2 shows the rate of material disposal in the On-Property Disposal Facility and the rate for material generation over the course of the OU3 interim remedial action, excluding OU2 and OU5 materials, as discussed in Section A.2.2. The figure shows the accumulation of generated material prior to August 1998. Once the On-Property Disposal Facility is available for this material, the accumulated material can be dispositioned in approximately two months. After that point, material is anticipated to be buried in the On-Property Disposal Facility as it is generated, with minimal lag time, thus removing the need for significant temporary storage demands. The reason for a difference between material generation and disposal into the cell from FY-95 through FY-98 is due to the expectation that the first module of the On-Property Disposal Facility will become available for use by OU3 approximately two years following the generation of a significant volume of material, thus creating a lag period for which interim storage may be necessary. Should the On-Property Disposal Facility be opened earlier and built at a faster rate, the difference between the two rates could be reduced, thus alleviating the need for storage of significant quantities of material.

A.3.2 Recycling

Recycling is the process of reusing material for a functional purpose. There are two types of recycling at the FEMP, radiologically uncontrolled and radiologically controlled. Uncontrolled recycling includes unrestricted use metals, which may be economically decontaminated to a releasable level if all potentially contaminated surfaces are accessible for direct contamination survey. In general, unrestricted use metal has a low surface area-to-mass ratio. Examples of reusable metal are structural steel, tanks, and decking. Currently, uncontrolled recycling is performed on a case-by-case basis, determined by the overall economics of whether or not it is more cost effective to decontaminate or otherwise treat materials for potential recycling. Also, estimates for recycling are determined on a project-specific basis due to the contracting of recycling facilities for specific material. Therefore, it is impossible at this time to determine if, when, or how much unrestricted use metal will be recycled. However, as stated in Section A.1, it will be assumed that all unrestricted use bulk metals such as structural steel will be recycled.

Controlled recycling consists of restricted use metals which cannot be economically decontaminated or surveyed to verify whether release limits have been met. In general, restricted use metal is light gauge with a high surface-area-to-mass ratio or has inaccessible areas where contamination may be present but is difficult to remove. Examples include metals such as ductwork, cabinets, machinery, and odd-sized forms. As a materials management practice, some restricted use scrap metal may include some unrestricted use metal if it is determined that the restricted end use is more cost effective. In general, refuse metal is radiologically contaminated and does not exhibit recoverable metal characteristics. Therefore, refuse metal is also considered restricted use scrap metal. Restricted use metal can be utilized by other DOE facilities and potentially other facilities licensed to handle nuclear materials. Since the current demand for this metal is very low among government facilities, little, if any, controlled recycling of restricted use metals is likely to occur. The OU3 RI/FS

TABLE A.3-1 Material Bulking Factors

OU3 RD/RA Category	Material Types	Bulking Factor
A	Non-Regulated/Non-Friable Asbestos-Containing Materials (ACM) (includes floor tile, fire brick, gasket material, and feeder cable)	2.00
B	Construction Debris (includes general refuse, ceiling material, built-up roofing/substrate, doors, windows, HEPA filters, and wood)	2.00
C	Compactible Waste (includes PPE and fiberglass insulation)	1.20
D	Transite (includes wall panels and roof panels)	1.20
E	Residues, Hold-Up Material, and Sludges	1.00
F	Masonry, Concrete, Asphalt	1.30
G	Acid Brick	1.30
H	Specialty Metals (includes nickel, copper, inconel, monel, stainless, and lead flashing)	2.00
I	Restricted Use Metals (includes equipment, roll-up/overhead doors, miscellaneous electrical components, metal wall panels, metal roof panels, louvers, and insulated wire with conduit)	3.47
J	Process Piping	2.00
K	Non-Process Piping	2.00
L	Ductwork	2.00
M	Furnaces and Dissociators	N/A(1)
N	Unrestricted Use Metals (includes structural steel and decking)	16.7
P	Regulated/Friable ACM (thermal system insulation)	4.00
Q	Decontamination Wash Waters	N/A(2)
R	Soils	1.25

(1) Bulking factors for furnaces and dissociators are not applicable since these materials will be removed and dispositioned as one piece.
(2) Bulking factor not applicable since water/liquids will not be containerized for temporary storage.

A.3.1 On-Property Disposal Facility

Currently, the OU2 Proposed Plan includes construction of an On-Property Disposal Facility for permanent disposition of remediation materials. Leading remedial alternatives for OU3 and OU5 plan to utilize an expanded version of the OU2 proposal. The On-Property Disposal Facility is anticipated to have a total capacity of approximately 2.5 million cubic yards of material when completed. Five modules would be constructed, each having a capacity of 500,000 cubic yards. Beginning in early 1997, one module would be constructed every four

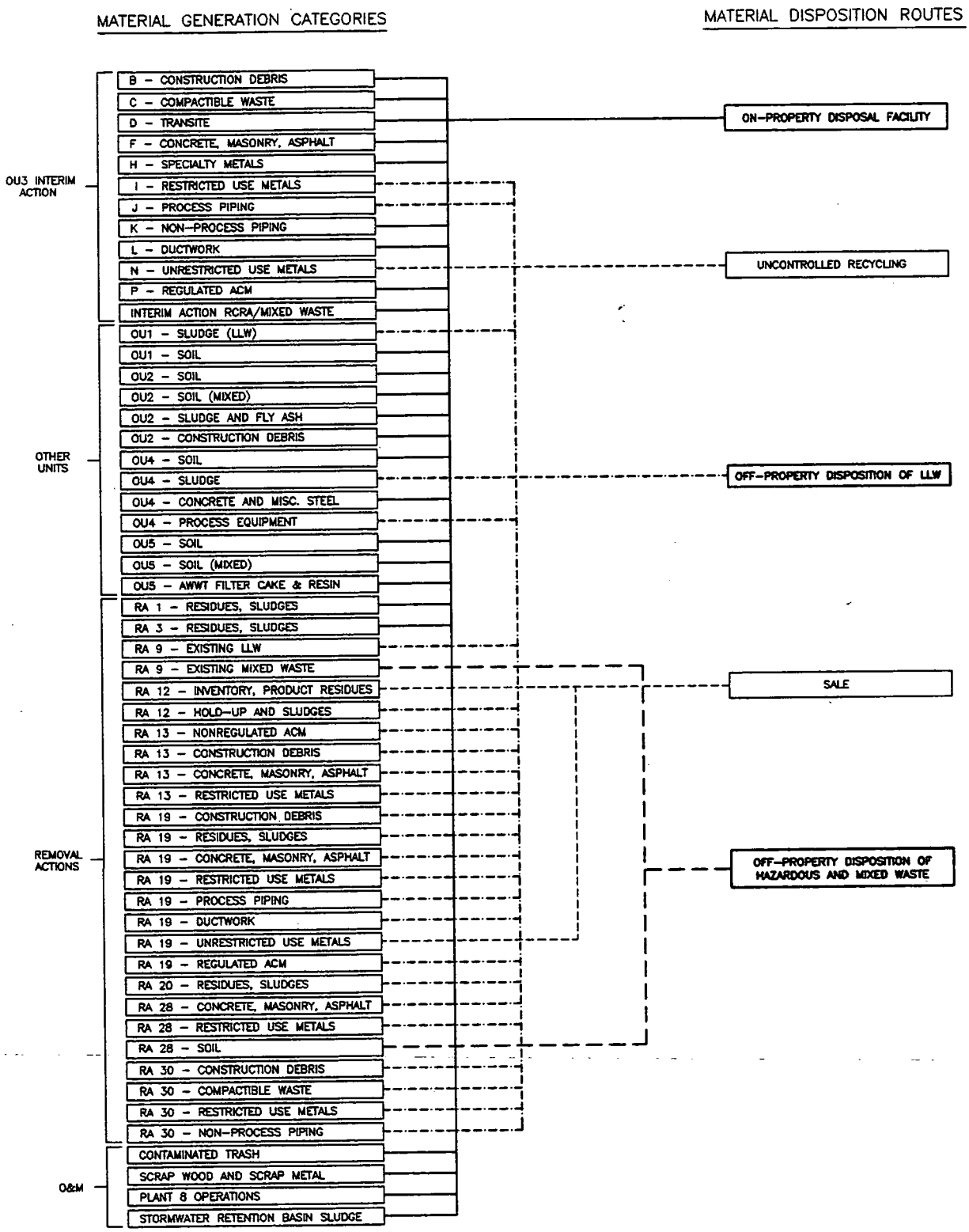


FIGURE A.3-1 Conceptual Diagram of Material Disposition Routes After Construction of the On-Property Disposal Facility

A.3 Material Disposition Schedules

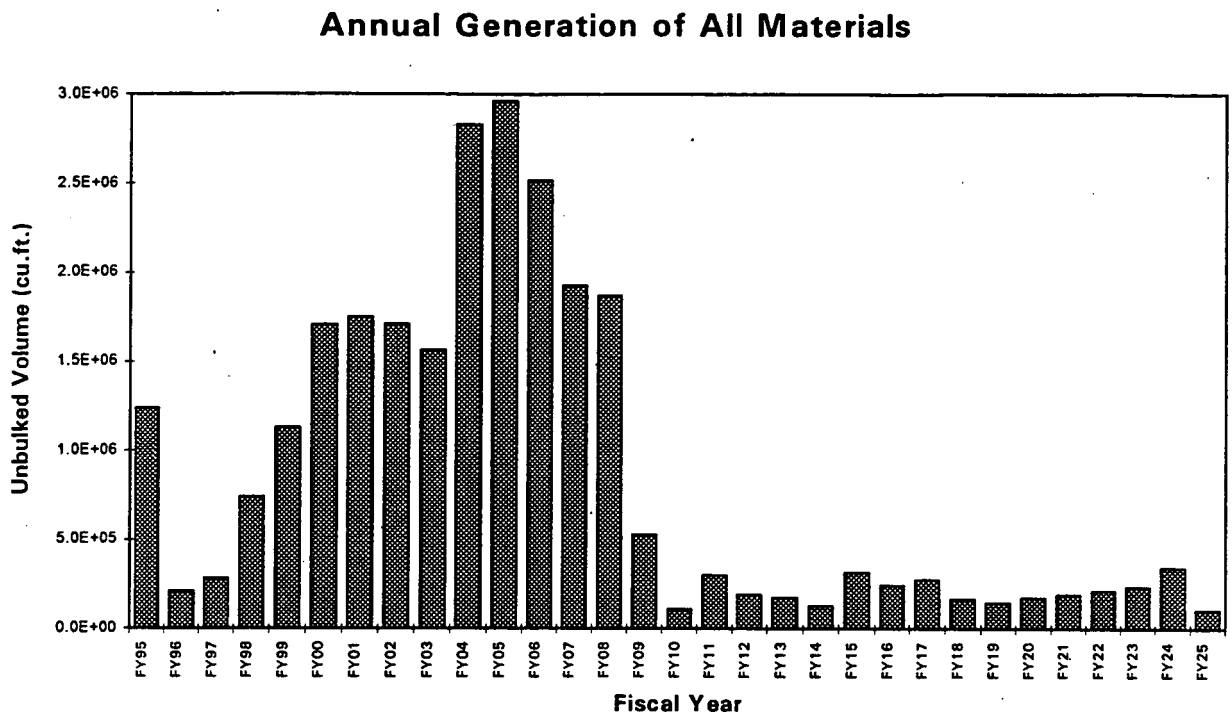
The current development of the OU3 RI/FS Report involves the evaluation of alternatives for final treatment and/or disposition of the OU3 materials. In order to complete a mass balance, preliminary assumptions on routes of disposition must be made; however, projections made in the PSR and the Material Balance Model may be altered during the development of the OU3 RI/FS Report. These changes will be reflected in any future revisions of the base schedule and/or the Material Balance Model.

The overall remediation of the FEMP is expected to generate approximately 26.8 million cubic feet of unbulked waste materials requiring disposition (excluding OU2 and OU5 materials). This section discusses the different types of material disposition expected over the duration of the OU3 interim remedial action. Disposal of materials in an On-Property Disposal Facility, recycling certain materials, shipping LLW off-property, and shipping hazardous and mixed wastes off-property are all possible types of material disposition discussed in this section.

Figure A.3-1 is a conceptual diagram showing anticipated disposal routes for the volumes of generated and to-be-generated material discussed in Section A.2 after all construction, assuming the leading remedial alternative for OU3 is selected. Figure A.3-1 does not reflect the possibility that a percentage of each OU3 RD/RA material category may not meet the WAC for the On-Property Disposal Facility. Any material that does not meet the WAC will either be treated or dispositioned off-property in accordance with the ROD that applies to that material.

As mentioned in Section A.2, the material volumes presented up to this point in the discussions are estimated as unbulked. Bulking factors must be applied to materials once total volume estimates are known in order to eventually identify capacities required for temporary storage (Section A.5). Bulking factors for each of the RD/RA material categories are listed in Table A.3-1.

The bulking factors listed in Table A.3-1 were determined based on several considerations that were researched during the development of the OU3 PP/EA and further refined during the current development of the OU3 RI/FS Report. These bulking factors are still being evaluated for the OU3 RI/FS Report and may be subject to change; however, they are presented here as being the most current values. The primary considerations included in determining bulking factors are data from material containerization during Removal No. 19 (Plant 7 Dismantling), ongoing waste management at the FEMP, and data from construction industry standards for materials without current bulking data. Unbulked material is loosely defined as material in its smallest reducible form without continuous physical manipulation (e.g., pressurization) to maintain a reduced size. An example of material in its smallest reducible form would be steel that has been melted and hardened into the shape of the container. It is emphasized here that once materials go into the On-Property Disposal Facility, voids are almost totally eliminated through compaction. For that reason, materials identified for disposal into the On-Property Disposal Facility in Section A.3.1 continue to be listed as unbulked.



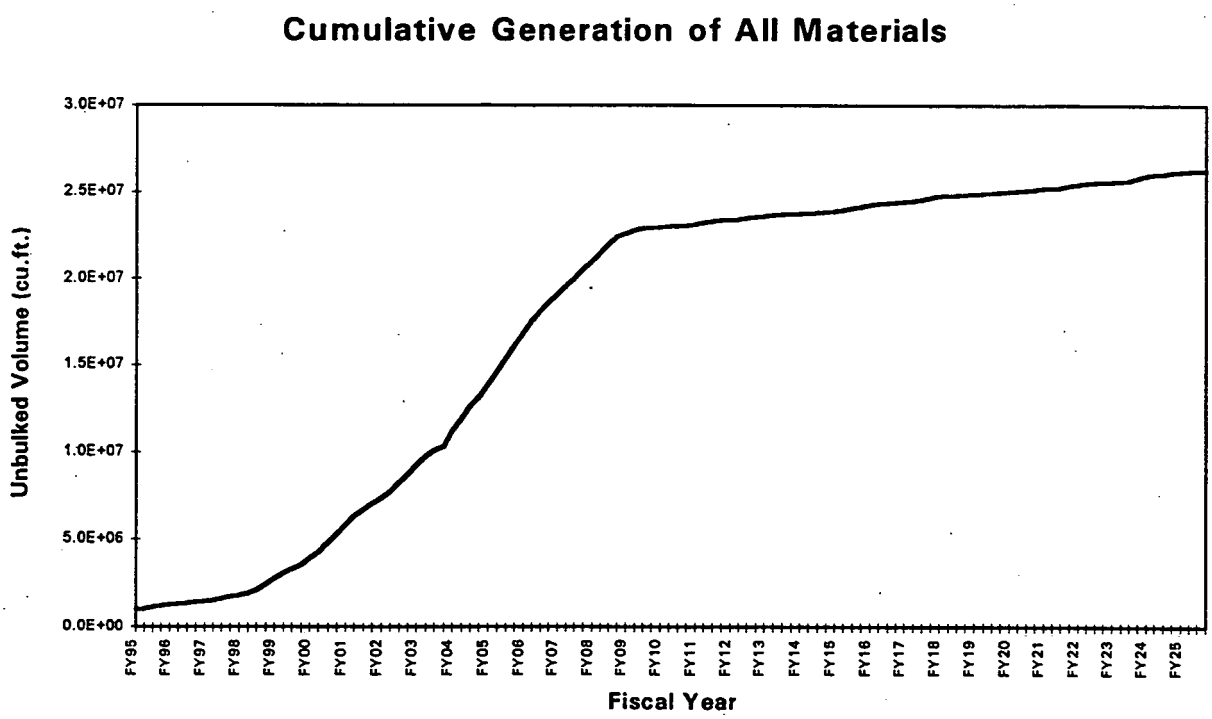
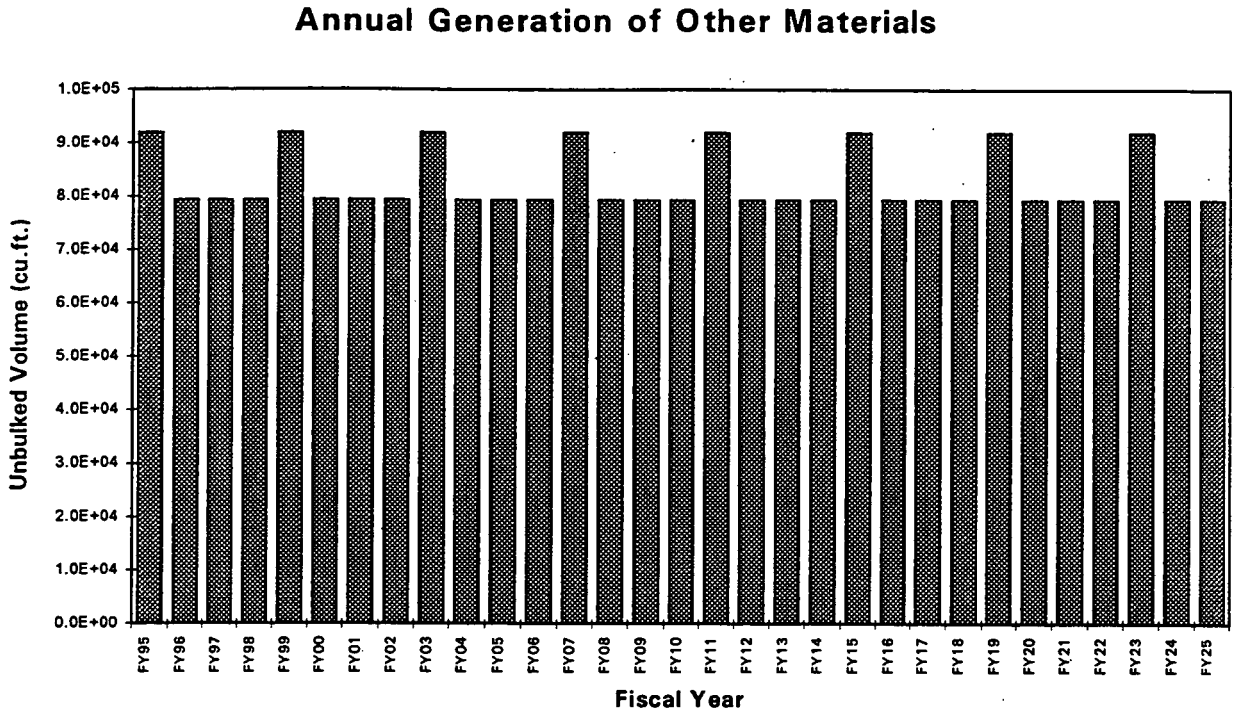


FIGURE A.2-20 Annual and Cumulative Generation of FEMP Materials

A.2.5 Material Generation Summary

By combining the material generation curves from the OU3 interim remedial action (Figure A.2-14), the OU1 remedial action (Figure A.2-16), the OU4 remedial action (Figure A.2-17), Removal Actions (Figure A.2-18), and Other FEMP Materials (Figure A.2-19) into one figure, Figure A.2-20 is a summary figure showing anticipated annual and cumulative generation for all FEMP materials. Figure A.2-20 will be used in the Material Balance Model discussed in Section A.6.



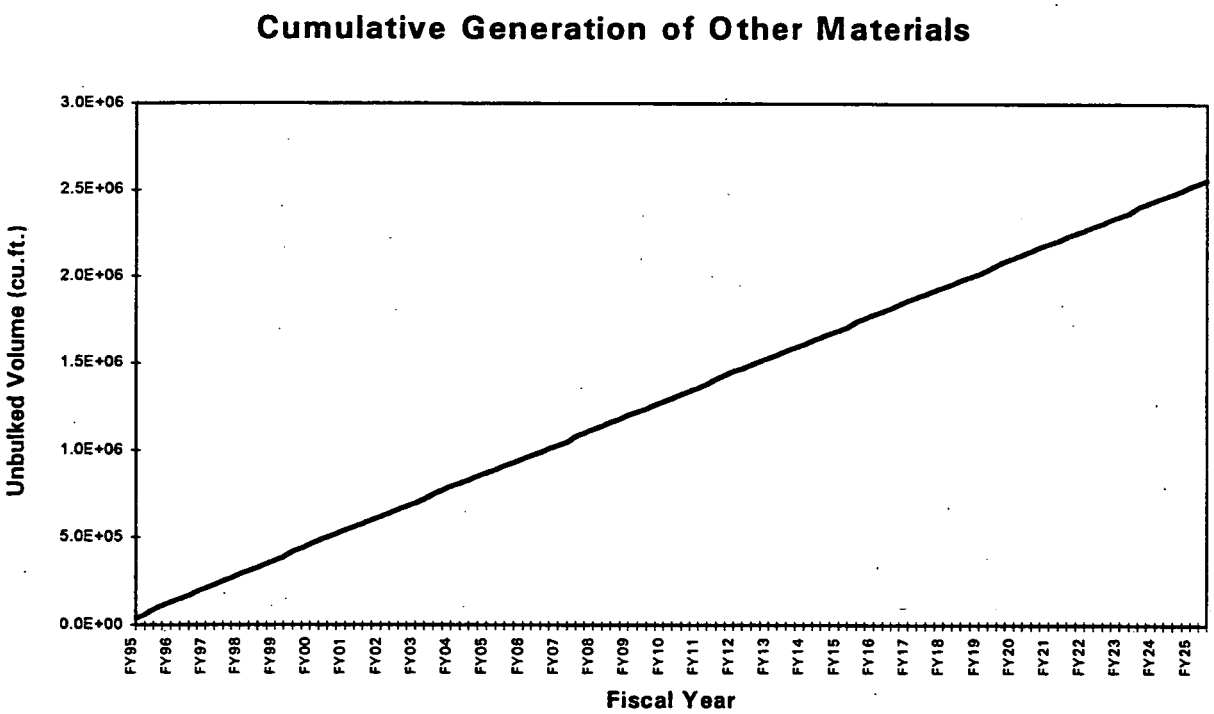


FIGURE A.2-19 Annual and Cumulative Generation of Other FEMP Materials

Treatment Plant are all currently treated in Plant 8. The wastewater is collected in the general sump, sampled, and then sent to Plant 8 for treatment. The Plant 8 treatment operation consists of a filtration system which filters the wastewater, producing filtrate and filtration residue waste (filter cake). After the wastewater is treated, it is then sampled again to ensure that the uranium concentration of the filtrate meets FEMP discharge levels. The filter cake produced from this treatment is shipped to NTS. Based on past data, it is estimated that about 615 drum equivalents (4,600 cubic feet) of this waste will be generated each year until the AWWT is operational (1995), whereupon Plant 8 will continue to be used for processing sump discharges until Plant 8 operation cease in 1999.

Storm Water Retention Basin Sludge

The Storm Water Retention Basins collect the storm water run-off from the FEMP site. The run-off water contains solids which over time settle to the bottom of basins. The basins are dredged every four years to remove silt build-up. The dredging is performed during the summer and takes about two months to complete. The resulting sludge must be treated and de-watered in Plant 8 or AWWT before its disposal at NTS. It is estimated that about 1,700 drum equivalents (12,600 cubic feet) of waste will be generated every four years.

Summary of Other Materials Generation

Table A.2-4 summarizes the annual generation of materials resulting from operation and maintenance activities. The total anticipated generation rate for these materials is shown in Figure A.2-19.

TABLE A.2-4 Volume Estimates of Operation and Maintenance Materials

Other Material Stream	OU3 RD/RA Category	Material Description	Unbulked Volume (ft^3)
Contaminated Trash	C	paper products, plastics, PPE, non-asbestos insulation, cardboard	29,750
Scrap Wood and Scrap Metal	B	construction debris, crushed drums, old pallets	33,750
Plant 8 Operations	E	filter cake from process water, perched water, rain water, Sewage Treatment Plant sludge	4,600
Storm Water Retention Basin Sludge	E	sludge	12,600 (1)
Generation of Other Materials		annual	68,100
		every fourth year (starting in FY-98)	80,700

(1) The sludge from the Storm Water Retention Basins is generated every four years rather than annually.

A.2.4 Other Materials

Waste materials that are generated from daily operations and maintenance activities at the FEMP that may require interim storage have been separated into four different categories:

- Contaminated Trash;
- Process Area Scrap Wood/Metal (including crushed drums);
- Plant 8 Operations (including Sewage Treatment Plant sludge); and
- Storm Water Retention Basin Sludge.

This section briefly discusses these categories and provides anticipated volume estimates for each of these four waste streams.

Contaminated Trash

Radiologically contaminated trash generated within radiologically controlled areas of the FEMP is collected, compacted, and shipped to NTS for disposal. The trash generally consists of paper products, plastics, non-asbestos insulation, cardboard, and PPE. Compacted bales of trash are placed into end-loading containers (commonly referred to as an ISO container or Sea/Land) for disposal at NTS. One end-loading container has a volume capacity of 1,025 cubic feet. It is estimated that 29 end-loading containers, or 29,750 cubic feet, of contaminated trash will be generated each year. This estimate is based on current generation rates which incorporate implementation of waste minimization efforts. However, it should be noted that this estimate is conservative since later years in the remediation schedule show that many facilities will have been removed along with some of the operations that generate this type of waste. A gradual decrease in the generation of contaminated trash is expected but precise estimates have not been made.

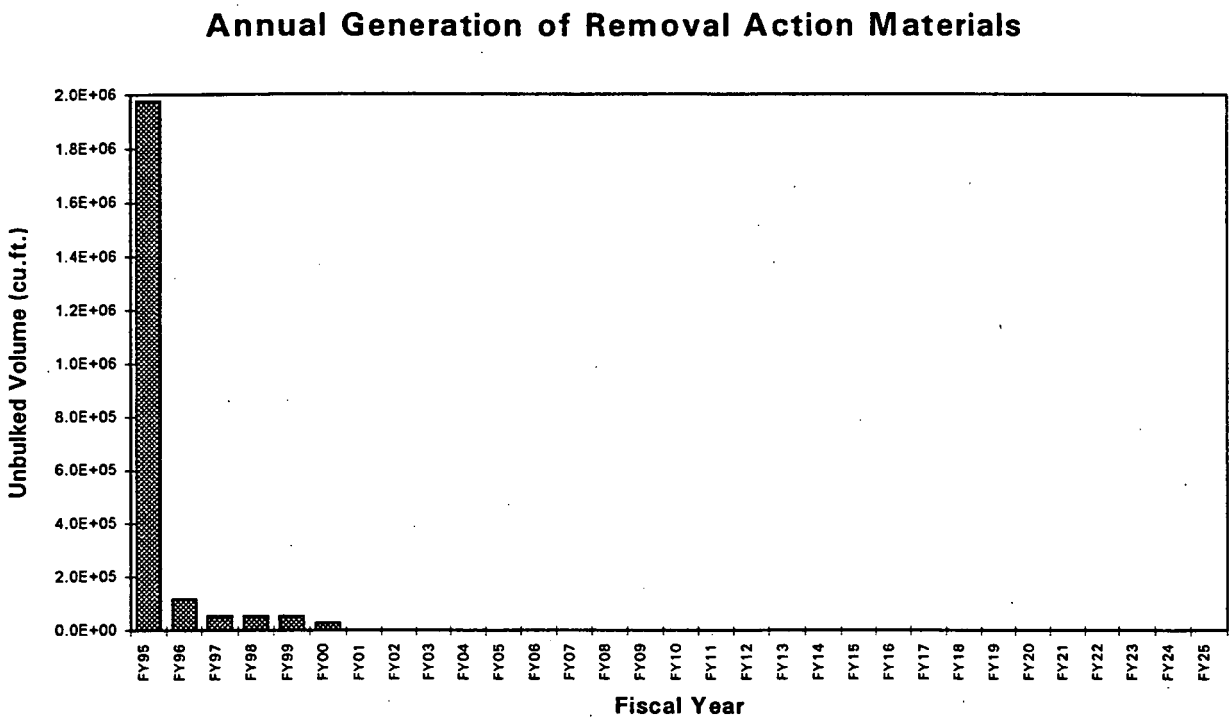
A waste minimization effort is underway to reduce the amount of contaminated trash generated. This effort includes collecting trash from areas where administrative controls have been established (e.g., offices, break rooms, rest rooms, etc.) and performing direct radiological frisks on a representative population (currently ten percent) of the bulked trash. If contamination is not detected, then the trash is dispositioned in a local sanitary landfill. If contamination is detected, then the trash is dispositioned as contaminated trash.

Process Area Scrap Wood/Metal

The former Production Area contains radiologically contaminated scrap wood and metal that has been stockpiled during FEMP operations. Scrap wood includes old pallets, odd sized pieces of lumber requiring special packaging, and any stockpiled wood products. Scrap metal consists of crushed drums, large pieces of metal, scrap vehicles, and any stockpiled metal materials. These materials are placed into end-loading containers for disposal at NTS. It is estimated that approximately 33 Sea/Lands, or 33,750 cubic feet of process area scrap wood and metal will be shipped to NTS each year through FY-06. As with the contaminated trash category, the generation of process area scrap wood/metal will decrease as facilities are removed from OU3. However, since a precise estimate is not available for out-year generation, the current generation rate of 33,750 cubic feet has been conservatively extrapolated over the duration of the OU3 interim remedial action.

Plant 8 Operations

Plant 8 serves as the current wastewater treatment system for the FEMP site. Process water, perched water, rain water collected from the process area, and sludge from the Sewage



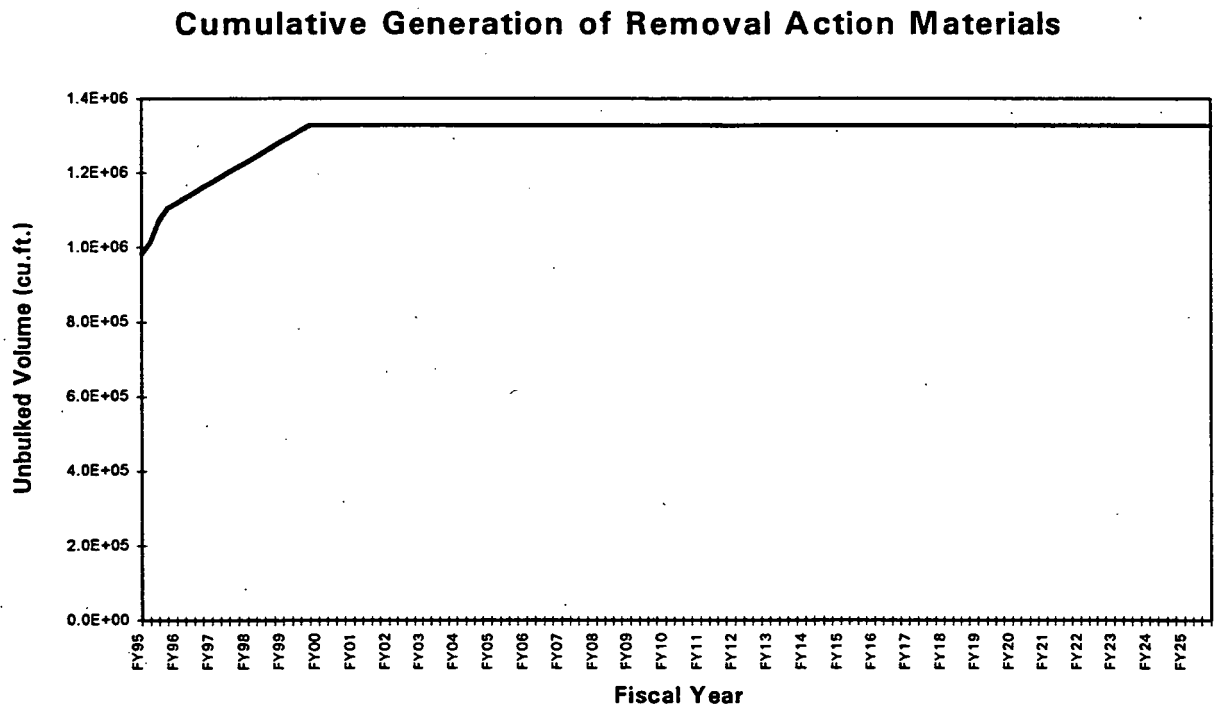


FIGURE A.2-18 Annual and Cumulative Generation of Materials from FEMP Removal Actions

TABLE A.2-3 Removal Action Volume Estimates (after FY-94)

Removal Action #	Removal Action Title	OU3 RD/RA Category	Material Type Description	Unbulked Volume (ft^3)
1	Contaminated Water Beneath FEMP Buildings	E	Residues, Sludges	10
3	South Groundwater Contamination Plume	E	Residues, Sludges	70
9	Removal of Waste Inventories		LLW	861,500
			Hazardous and Mixed	98,500
12	Safe Shutdown		Nuclear Product	274,300
		E	Hold-up/Sludges	2,800(1)
13	Plant 1 Ore Silos	A	Non-Regulated ACM	700
		B	Construction Debris	10
		F	Concrete, Masonry, Asphalt	3,100
		I	Restricted Use Metals	10,000
19	Plant 7 Dismantling	B	Construction Debris	10,681(2)
		D	Transite	1,733(2)
		E	Residues, Sludges	7(2)
		F	Concrete, Masonry, Asphalt	560(2)
		H	Specialty Metals	27(2)
		I	Restricted Use Metals	5,876(2)
		N	Unrestricted Use Metals	2,815(2)
		P	Regulated ACM	103(2)
20	Stabilization of UNH Inventories	E	Residues, Sludges	26,740
26	Asbestos Removals	P	Regulated ACM	(3)
		D	Transite	(3)
28	Contamination of the Fire Training Facility	F	Concrete, Masonry, Asphalt	3,640
		I	Restricted Use Metals	10
		R	Soil	1,500
30	South Field Seepage Control	R	Soil	24,300
Total Removal Action Material Generation				1,329,000

(1) Volume estimates for hold-up material/sludges are estimated by complex in Table A.2-2.

(2) Material volumes for Removal No. 19 reflect actual volumes generated in FY-95, rather than volume estimates.

(3) Volume estimates for Removal No. 26 are included with OU3 material volume estimates in Section A.2.1.

be stored in an OU5 controlled soil storage pile located south of the Storm Water Retention Basin and, as a result, will not require the use of OU3 storage facilities. This volume of soil will be accounted for as being generated by Removal No. 30 in this section but will be accounted for under OU5 for material accumulation (Section A.4).

Total Removal Action Material Generation

The information summarized in Table A.2-3 identifies the unbulked volume estimates for removal action materials that are anticipated to be generated beginning FY-95. Figure A.2-18 presents the total anticipated material generation curve for the FEMP removal actions.

During FY-95, the material that was generated as a result of this removal action consisted of 10,681 cubic feet of construction debris; 1,733 cubic feet of transite; 7 cubic feet of residues and sludges; 560 cubic feet of concrete, masonry, and asphalt; 27 cubic feet of specialty metals; 5,876 cubic feet of restricted use metals; 2,815 cubic feet of unrestricted use metals; and 103 cubic feet of regulated ACM.

Removal No. 20 - Stabilization of UNH Inventories
Stabilization and disposition of approximately 200,000 gallons of uranyl nitrate hexahydrate (UNH) solution was initiated as an emergency removal action in September 1991, due to small UNH piping leaks discovered on September 17, 1991 that posed an imminent threat to the environment. The stabilization process will neutralize an estimated 200,000 gallons of uranyl nitrate hexahydrate solution. This removal action is expected to occur from January 1995 through September 1995 and will generate an estimated 26,700 cubic feet of filter cake.

Removal No. 26 - Asbestos Removals (Asbestos Program)
Asbestos removal program activities were identified as a Phase III removal action to document the ongoing asbestos abatement at the FEMP. The primary objective of the ongoing asbestos abatement program is to mitigate the potential risk to FEMP employees and the environment from asbestos at the FEMP.

The material associated with this removal action has been accounted for in the estimates for the OU3 interim remedial action (Table A.2-1) under Category P (regulated, friable ACM) and Category D (transite). Although some maintenance-related asbestos removal activities will be performed under this removal action, the majority of asbestos removal will be performed under the OU3 interim remedial action as one of the remedial tasks prior to dismantlement, as discussed in Section 3.3.4 of the OU3 RD/RA Work Plan.

Removal No. 28 - Contamination of the Fire Training Facility
Portions of the Fire Training Facility were determined to be a HWMU under the requirements of RCRA. Elevated levels of hazardous contaminants are present at or near the surface of soils in the facility. Because of the potential for the contaminants to migrate, there is a threat of a release at the Fire Training Facility. The removal action includes removal, decontamination, treatment, and disposal or storage of all structures, tanks, equipment, and contaminated soil.

Material expected to be generated during FY-95 as a result of this removal action consists of approximately 3,640 cubic feet of concrete and asphalt, 10 cubic feet of restricted use metal, and 1,500 cubic feet of soils.

Removal No. 30 - South Field Seepage Control
The South Field and Inactive Flyash Pile are located southwest of the former production area. These units were used as disposal areas for non-process wastes including Boiler Plant ash and construction debris. Much of the material is contaminated with low concentrations of uranium, and has created a run-off problem which is to be addressed through this removal action.

It is anticipated that approximately 24,300 cubic feet of low-level radioactive soil and sediment will be generated in April and May, 1995. A small quantity of miscellaneous construction debris will be generated but is being considered a negligible amount for the Material Balance Model. This material, however, is proposed in a draft work plan by OU2 to

TABLE A.2-2 Hold-Up Material Volume Estimates (after FY-94)

Complex	Solid Hold-Up Quantities (in pounds)	Solid Hold-Up Quantities (in cubic feet)
Plant 1 Complex	18,400	160
Plant 2 Complex and Plant 3 Complex	15,700	130
Plant 4 Complex	6,000	50
Plant 5 Complex	127,000	1,060
Plant 6 Complex	146,500	1,230
Plant 8 Complex	12,600	100
Pilot Plant Complex	3,500	30
Thorium/Plant 9 Complex	4,100	40
Total Hold-Up Material Generation	333,800	2,800

Assumptions:

- Assumes that all material is packaged in 55-gallon drums and that all solid material will be weight restricted to the Department of Transportation-regulated limit of 882 pounds per 55-gallon drum.
- Hold-up material will be placed in covered storage.
- Hold-up material is assumed to not meet the WAC of the On-Property Disposal Facility and will therefore be dispositioned at NTS.

Removal No. 13 - Plant 1 Ore Silos

The Plant 1 Ore Silos were used in sampling and blending uranium ores. The ore silos included the two groups of silos south of Plant 1, consisting of eight glazed tile silos to the west and six reinforced concrete silos to the east. Chipping and cracking of the tile shells due to weathering was first observed on the eight tile silos in the 1970s. The steel support structures exhibited signs of extensive corrosion, with rust evident throughout. Because of the questionable integrity of the silos and their supporting structures, a structural evaluation was performed in late 1990 and early 1991, and it was recommended that the entire facility be demolished. The demolition of the Plant 1 Ore Silos began in October 1992, thus producing waste materials.

During FY-95, in which Removal No. 13 is expected to be completed, 700 cubic feet of non-regulated/non-friable ACM, 10 cubic feet of construction debris, 3,100 cubic feet of masonry, concrete, asphalt, and 10,000 cubic feet of restricted use metal is anticipated to be generated.

Removal No. 19 - Plant 7 Dismantling

Plant 7 was formerly used from 1954 to 1956 for the reduction of uranium hexafluoride to uranium tetrafluoride and used as a warehouse thereafter. The Plant 7 structure has been dismantled to its concrete foundation, but all of the waste materials associated with the dismantlement had not yet been dispositioned by the end of FY-94.

System. A material description code number between 001 and 199 is considered a LLW. Also, any material with a code number above 200 that contained thorium was considered LLW. Examples of LLW include: non-recoverable trash; contaminated soil, sand, bricks, and ceramics; magnesium fluoride; dust collector residues; filter cake (non-oily and non-halide); thorium residues; thorium fluoride; thorium hydroxide (dry); and uranium residues. The total volume of the LLW was approximately 861,500 cubic feet.

Removal No. 12 - Safe Shutdown

In July 1991, the FEMP initiated the Safe Shutdown program to provide planning, engineering, and program control for the proper disposition of uranium products and in-process residue materials, excess supplies, chemicals, and associated process equipment. The program also is intended to ensure the proper characterization, emptying, and de-energizing of the majority of existing, previously operated, production-related equipment.

One of the major objectives of the Safe Shutdown program involves the removal of materials from previously operated production-related equipment in order to alleviate the potential for a nuclear criticality accident and to mitigate risks to human health and the environment by decreasing the quantity of hold-up materials below the hazard category 3 level. After confirmation of characterization, these materials will be transferred to appropriate containers and either stored at approved locations awaiting final disposition under the OU3 final remedial action ROD or dispositioned in accordance with the requirements of Removal No. 9. The estimated quantities of hold-up materials (material contained within process equipment) that will be removed during Safe Shutdown from FY-95 through FY-99 are identified for each of the complexes that have a major processing facility and are identified in Table A.2-2.

Other material accounted for under this removal action includes inventory and product residues that potentially have market value. As described above in Removal No. 9, the Residue and All Materials Inventory Database, and the FEMP Lot Marking and Color Coding System were used to sort the approximately 99,000 waste containers being stored on-property into three categories: LLW; inventory and product residues (i.e., nuclear material considered as having market value); and hazardous and mixed waste.

A material description code number of 200 or greater, excluding materials containing thorium, generally corresponds to a nuclear material of recorded value; however, there are material types below 200 that are still considered "nuclear material" because they have sufficient uranium assay and U-235 content to be considered potentially recoverable or above the economic discard limit. As a result, materials having a code below 200 were reviewed for this model and those that met the criteria for being marketable were included in the estimate for nuclear product. Uranium ingots and derbies, UO_3 (orange oxide) reactor recycle tails, UF_4 (green salt), and mark 31 castings are all examples of this nuclear material. The total volume of this potentially marketable nuclear material is about 274,300 cubic feet.

Removal No. 1 - Contaminated Water Beneath FEMP Buildings
This time-critical removal action was initiated to pump contaminated perched water from piezometers and extraction wells underneath the Ore Refinery Plant (2A), the Metals Fabrication Plant (6A), the Metals Recovery Plant (8A), and the Special Products Plant (9A). These perched waters have been found to contain elevated concentrations of uranium and several volatile organic compounds (VOCs) (i.e., trichloroethene, dichloroethane, dichloroethylene, trichloroethane, and tetrachloroethene). After pumping, the perched water is transferred to the Plant 8 VOC Treatment System for removal of the VOCs. The water is then treated for uranium removal in the Plant 8 wastewater treatment system.

The VOC and uranium treatment will generate a limited amount of sludge (approximately 10 cubic feet) before the AWWT is completed during FY-95. As soon as the AWWT becomes operational, the perched water will be processed through the AWWT. It is anticipated that the sludges resulting from the AWWT treatment of perched waters will be dispositioned into the On-Property Disposal Facility as they are generated, providing they meet the on-property WAC. The liquids are not considered in the Material Balance Model for the evaluation of storage needs since they are processed immediately.

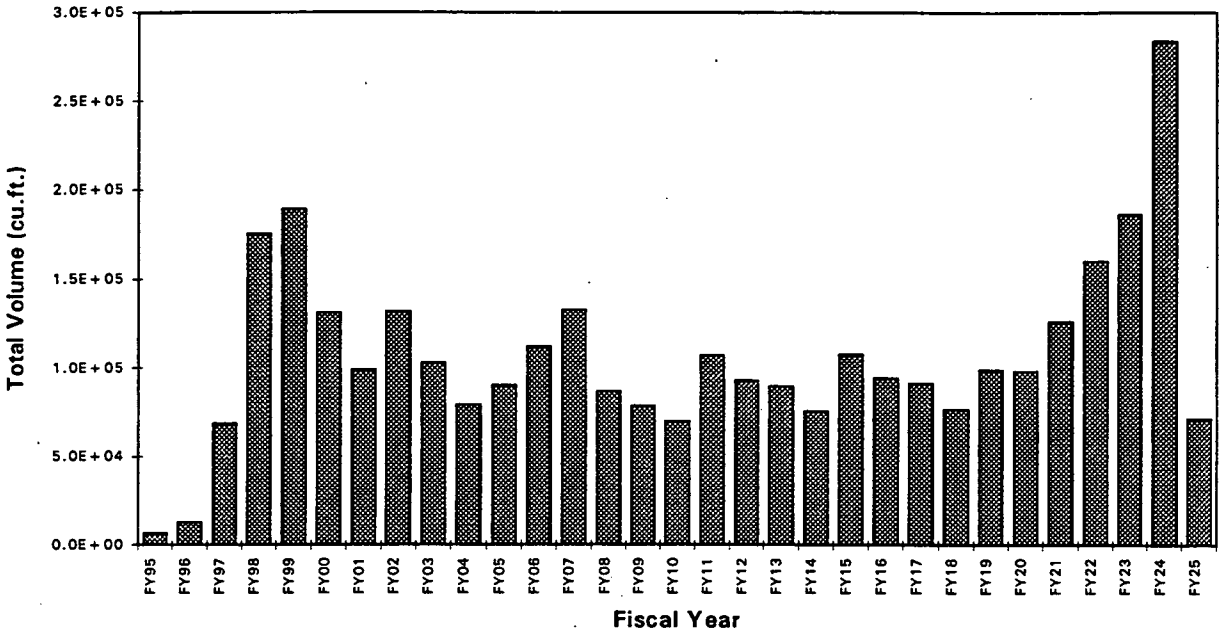
Removal No. 3 - South Groundwater Contamination Plume
The Great Miami Aquifer contains a uranium-contaminated plume within areas south of the FEMP. Removal No. 3 involves treatment of waters pumped from the contaminated plume. This action will result in the generation of approximately 70 cubic feet of sludge during FY-95 until the south plume groundwater is processed by the AWWT. The generation of sludges resulting from the AWWT treatment of the south plume groundwater is included in the OU5 material generation estimates discussed in Section A.2.2. The liquids are not considered in the Material Balance Model for the evaluation of storage needs since they are processed immediately.

Removal No. 9 - Removal of Waste Inventories
The FEMP has initiated a large-scale, off-property waste shipment program involving the transfer of inventoried and newly generated LLW to NTS, and hazardous and mixed waste to the Envirocare of Utah, Inc. site in Clive, Utah. Although this removal action will continue as an activity to remove waste inventories after FY-95, the volumes of materials currently stockpiled (i.e., as of the beginning of FY-95) for disposition under this removal action have been identified as existing wastes that contribute to the baseline of existing materials in the material generation summary at the end of this section.

At of the end of FY-94, the FEMP site was storing approximately 99,000 waste containers of various sizes. The waste in these containers includes legacy waste (i.e., wastes generated prior to commencing remedial activities), materials generated from removal actions, and any other waste needing on-property storage. Using the Residue and All Materials Inventory Database, the stored wastes were sorted into three categories: LLW; inventory and product residues (i.e., nuclear material considered as having market value); and hazardous and mixed waste.

First, the database was queried to list all the hazardous/mixed waste being stored on-property. This data was then added to calculate the total volume of existing containerized hazardous/mixed waste, which was approximately 98,500 cubic feet. Next, the database was run to list all the non-hazardous waste being stored on-property. This data was then sorted by the material description code listed in the FEMP Lot Marking and Color Coding

Annual Generation of Materials for Disposition in the Cell



Cumulative Generation and Shipment of Materials to the Cell

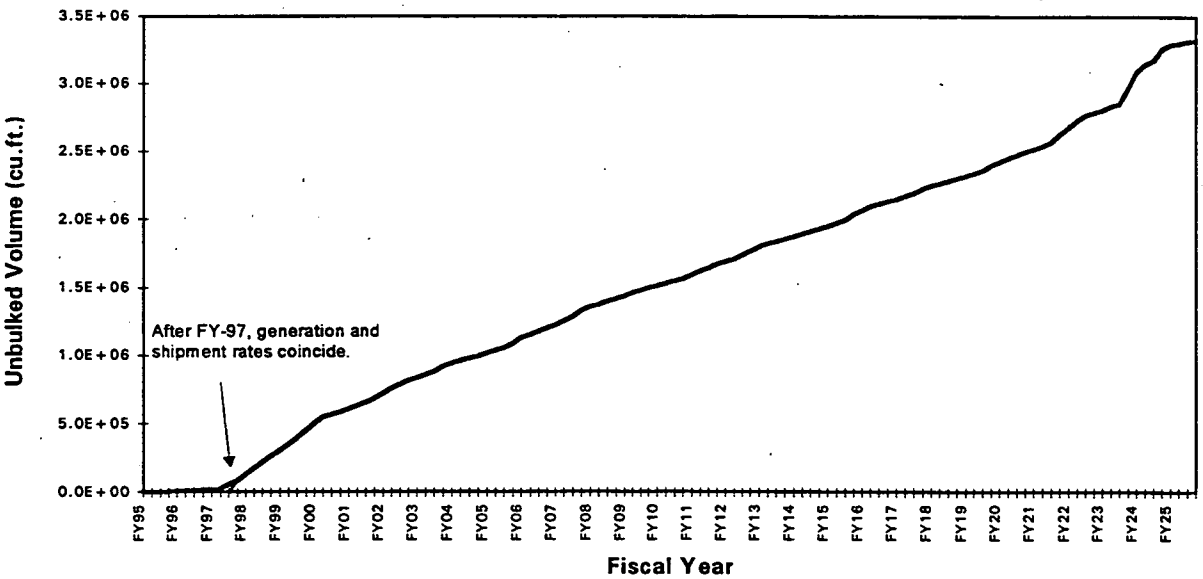


FIGURE A.3-2 Annual and Cumulative Generation and Shipment of Material to be Disposed in the On-Property Disposal Facility

Report, which is currently being developed, may include controlled recycling as a final material disposition option.

A.3.3 Off-Property Disposition of Low-Level Waste

Currently, the FEMP has the capacity to ship approximately 79,000 drum equivalents (585,000 cubic feet) of LLW off-property to NTS each year. This disposition rate is assumed to be maintained over the course of the OU3 interim remedial action. DOE-FN is pursuing waste minimization efforts and are exploring other disposal options, thereby minimizing shipments to NTS, as well as other locations. The OU3 RI/FS Report will evaluate waste minimization efforts such as recycling, decontamination for free-release of material, volume reduction through treatment, and other technologies. Figure A.3-3 compares the rates of LLW generation to the rate of LLW material being shipped off-property over the course of the OU3 interim remedial action. Although Figure A.3-3 shows that the generation rate for LLW material is less than the rate for NTS disposal until FY-98, the initial backlog of existing LLW awaiting shipment to NTS necessitates temporary storage. From FY-98 and thereafter, NTS shipments meet the demand for disposal and therefore interim storage is not needed.

A.3.4 Hazardous and Mixed Waste Disposition

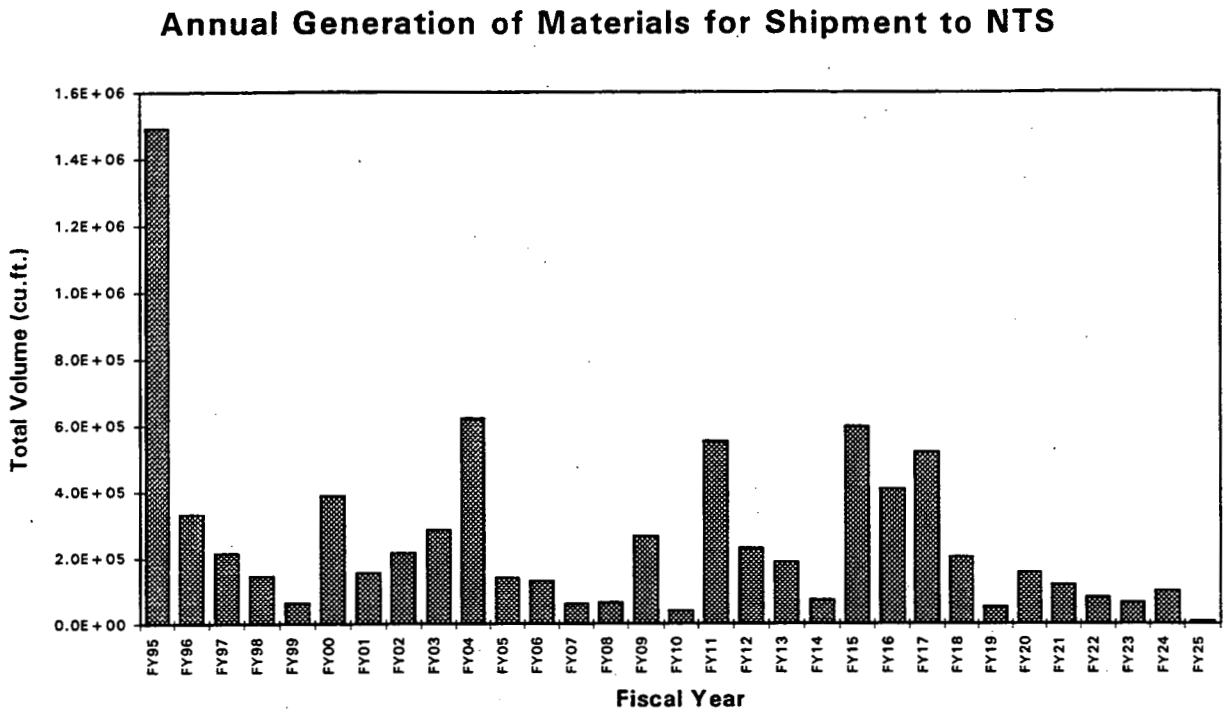
As described in Section A.3.1, the construction of an On-Property Disposal Facility will allow many waste materials to be disposed of on-property. Therefore, hazardous and mixed wastes which meet the on-property WAC could potentially be dispositioned in the On-Property Disposal Facility starting in August 1998. In FY-95, approximately 8,000 drum equivalents (59,000 cubic feet) of hazardous and mixed waste will either be shipped to Envirocare or will be treated to eliminate their hazardous nature. After FY-95, the existing mixed waste inventory will be similarly reduced by approximately 2,000 drum equivalents (15,000 cubic feet) per year until the On-Property Disposal Facility is operational. Figure A.3-4 shows that the off-property disposition rate of hazardous and mixed wastes coincides with the rate of generation of that material. This result indicates that there should not be a need to temporarily store hazardous and mixed wastes beyond what is needed to support shipments.

A.3.5 Nuclear Product Disposition

As described in Section A.2.3, Removal No. 12 (Safe Shutdown) is responsible for removing all nuclear hold-up material from previously operated production-related equipment. Any nuclear products recovered from this activity will be added to the current inventory of product and residues. This inventory of nuclear products has a recorded value and, therefore, cannot be considered waste. Although DOE is currently pursuing buyers for this product, only the uranium derbies have been sold at this time. It is not possible to predict if and when the remaining nuclear products will be sold and shipped to government approved buyers. For purposes of this report, these materials are assumed to be retained in on-property storage until disposition (conservatively assumed to be within ten years).

A.3.6 Material Disposition Summary

The total material disposition rate over the course of the OU3 interim remedial action for both on-property and off-property disposition combined are shown in Figure A.3-5. The figure shows that the overall dispositioning of materials does not meet the demand for disposition until the middle of FY-98.



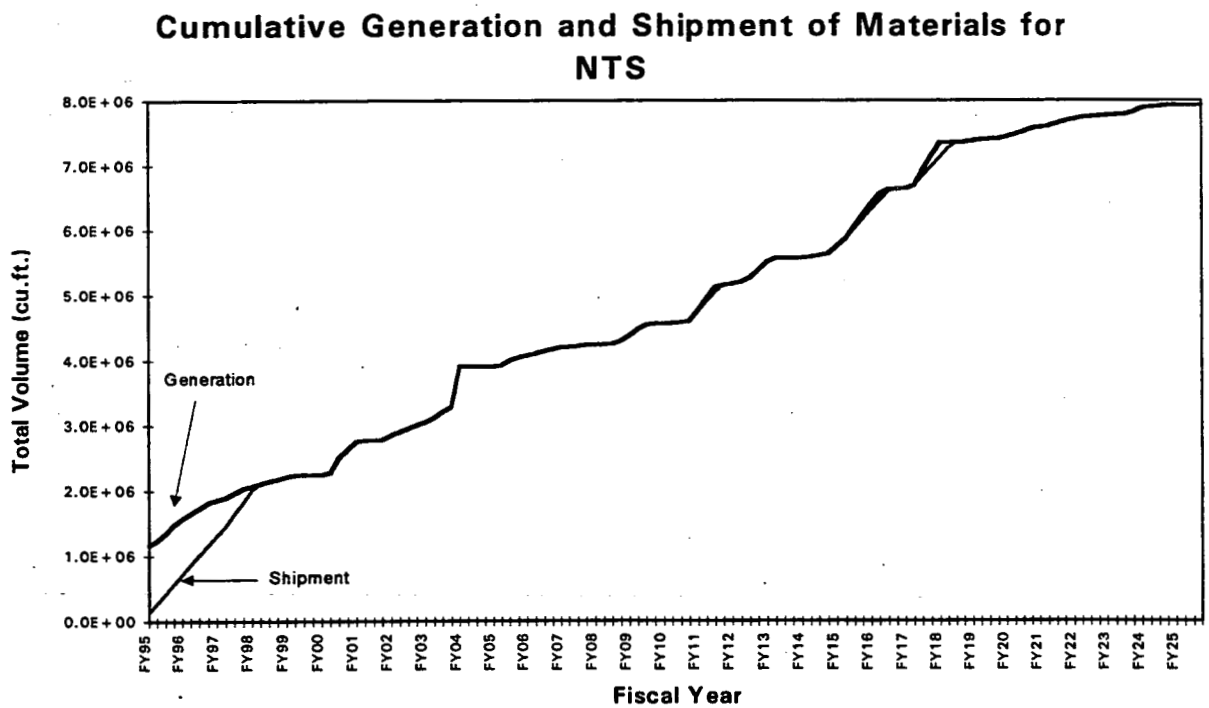
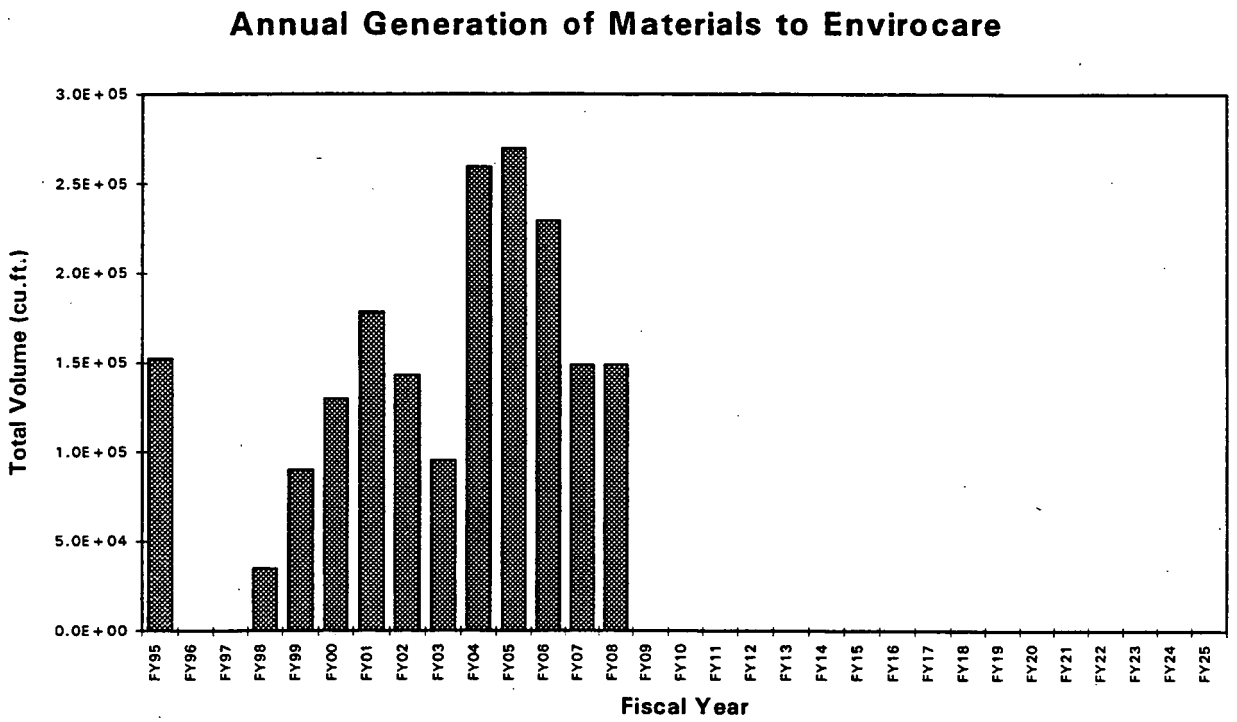


FIGURE A.3-3 Annual and Cumulative Generation and Shipment of Low Level Waste to be Shipped Off-Property



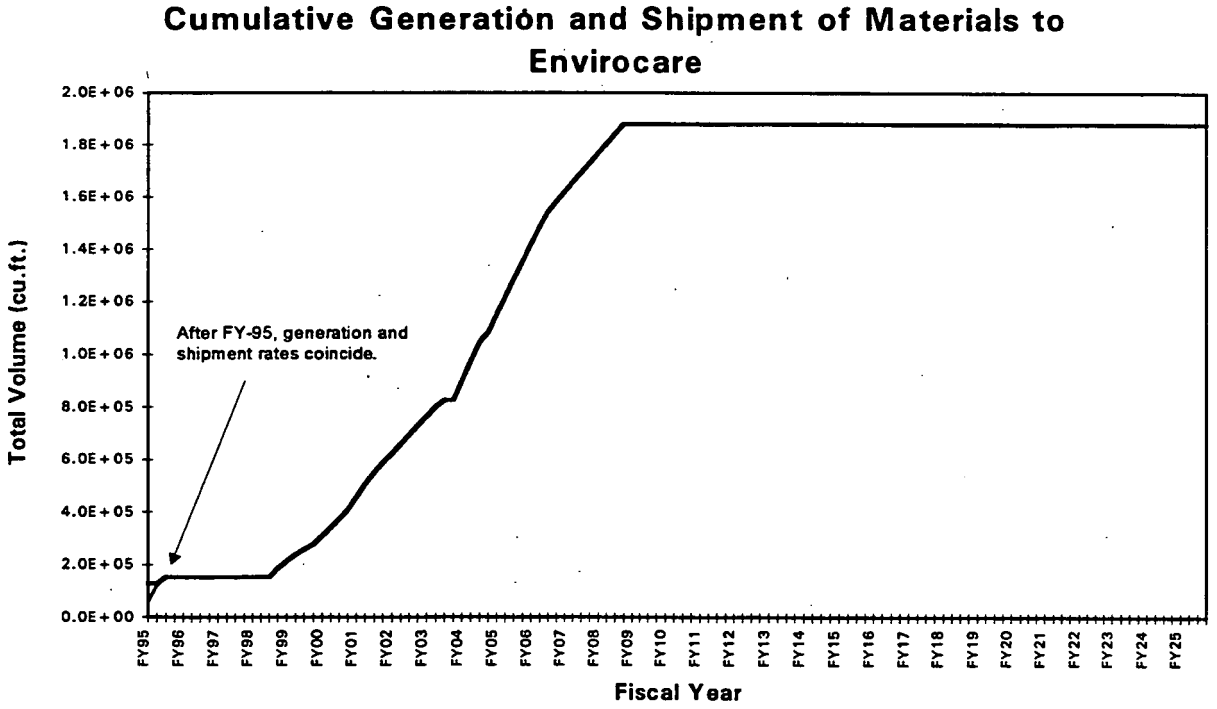
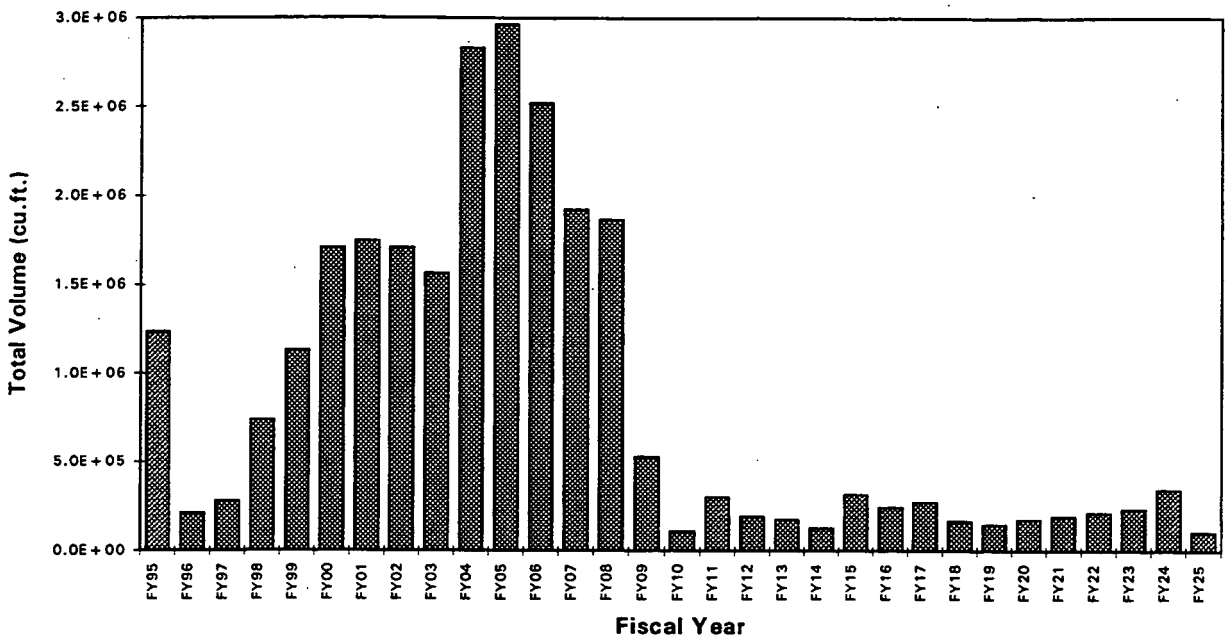


FIGURE A.3-4 Annual and Cumulative Generation and Shipment of Hazardous and Mixed Waste to be Shipped Off-Property

Annual Generation of All Materials



Cumulative Generation and Shipment of All Materials

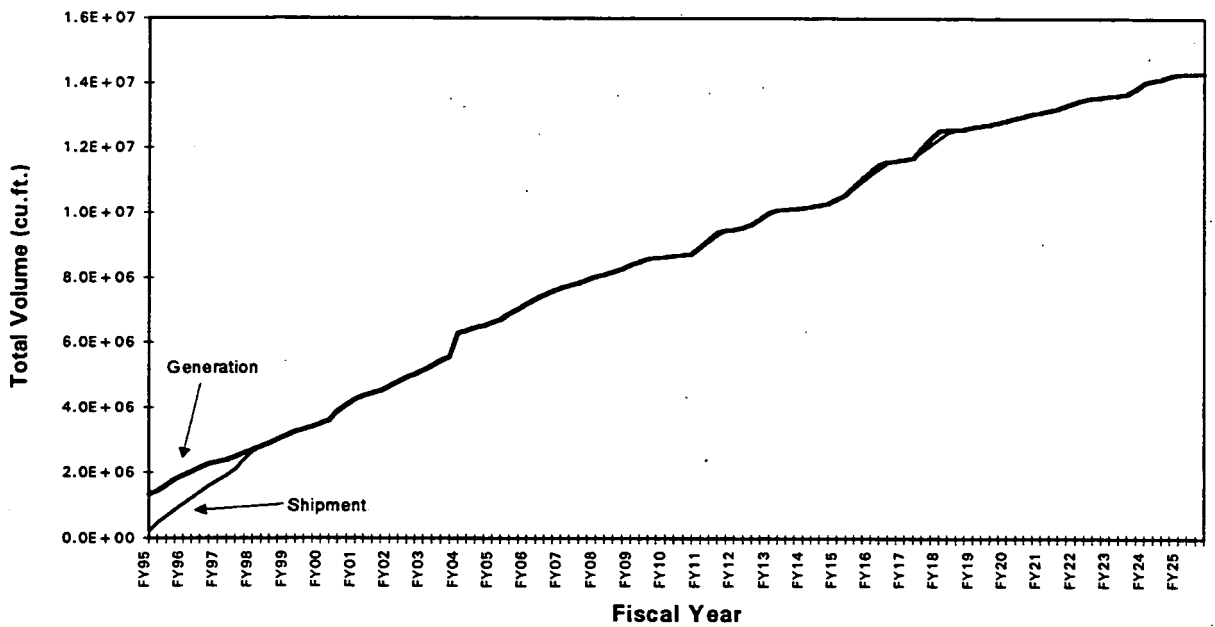


FIGURE A.3-5 Annual and Cumulative Generation and Shipment of All Generated Material

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A.4 Material Accumulation

As mentioned in Section A.3.6, materials will accumulate during the OU3 interim remedial action and require storage on-property while waiting final disposition. These materials have been divided into three types: hazardous and mixed wastes; non-RCRA wastes requiring covered interim storage; and wastes to be stored in uncovered interim storage. Figure A.4-1 is a conceptual diagram showing anticipated interim storage options for the material categories discussed in Section A.2. As discussed in Sections A.2.2, materials generated by OU2 and OU5, along with various other materials discussed in Sections A.2.3 and A.2.4, are planned to be dispositioned directly into the On-Property Disposal Facility without being temporarily stored and therefore are not reflected in Figure A.4-1.

The material balance equation, discussed in Section A.1, was used to determine the accumulation of hazardous and mixed wastes, non-RCRA materials requiring covered interim storage, and materials to be stored in uncovered interim storage at any given time during the OU3 interim remedial action. Specifically, accumulation is calculated by subtracting material disposition quantities presented in Section A.3 from the material generation rates presented in Section A.2.

The determination of the required storage space for generated material discussed in Section A.2 is dependent upon the type of container used to store the material, the material capacity of each type of container, and allowable stacking of the containers within the type of storage facility. Table B-4 (Appendix B) lists the anticipated container type for each of the OU3 RD/RA material categories. Material generated by removal actions, other remedial actions, and operation and maintenance activities are assumed to follow similar containerization requirements. For the purposes of performing the Material Balance Model, it was conservatively assumed that all materials will be containerized while in interim storage (i.e., no bulk storage of materials). In addition, the following container footprint and stacking assumptions were used in determining required storage space:

- Roll-off containers have a storage footprint of 188 ft^2 and cannot be stacked;
- White metal boxes (WMB) have a storage footprint of 30.6 ft^2 and can be stacked three high;
- Top-loading and end-loading containers have a storage footprint of 160 ft^2 and can be stacked two high; and
- Four 55-gallon drums can be stored on a wooden pallet, which has a storage footprint of 16 ft^2. Similarly, three 85-gallon or three 110-gallon overpack containers can be stored per pallet. Pallets of drums or overpack containers can be stacked three high in uncovered storage and four high in covered storage.

This approach was used to calculate the material storage requirements for hazardous and mixed wastes, non-RCRA materials requiring covered storage, and materials to be temporarily stored uncovered (shown in Figures A.4-2 through A.4-4, respectively). Section A.6 compares these material storage requirements to the available floor space (determined in Section A.5) to evaluate the impact of the base schedule to the management of FEMP materials.

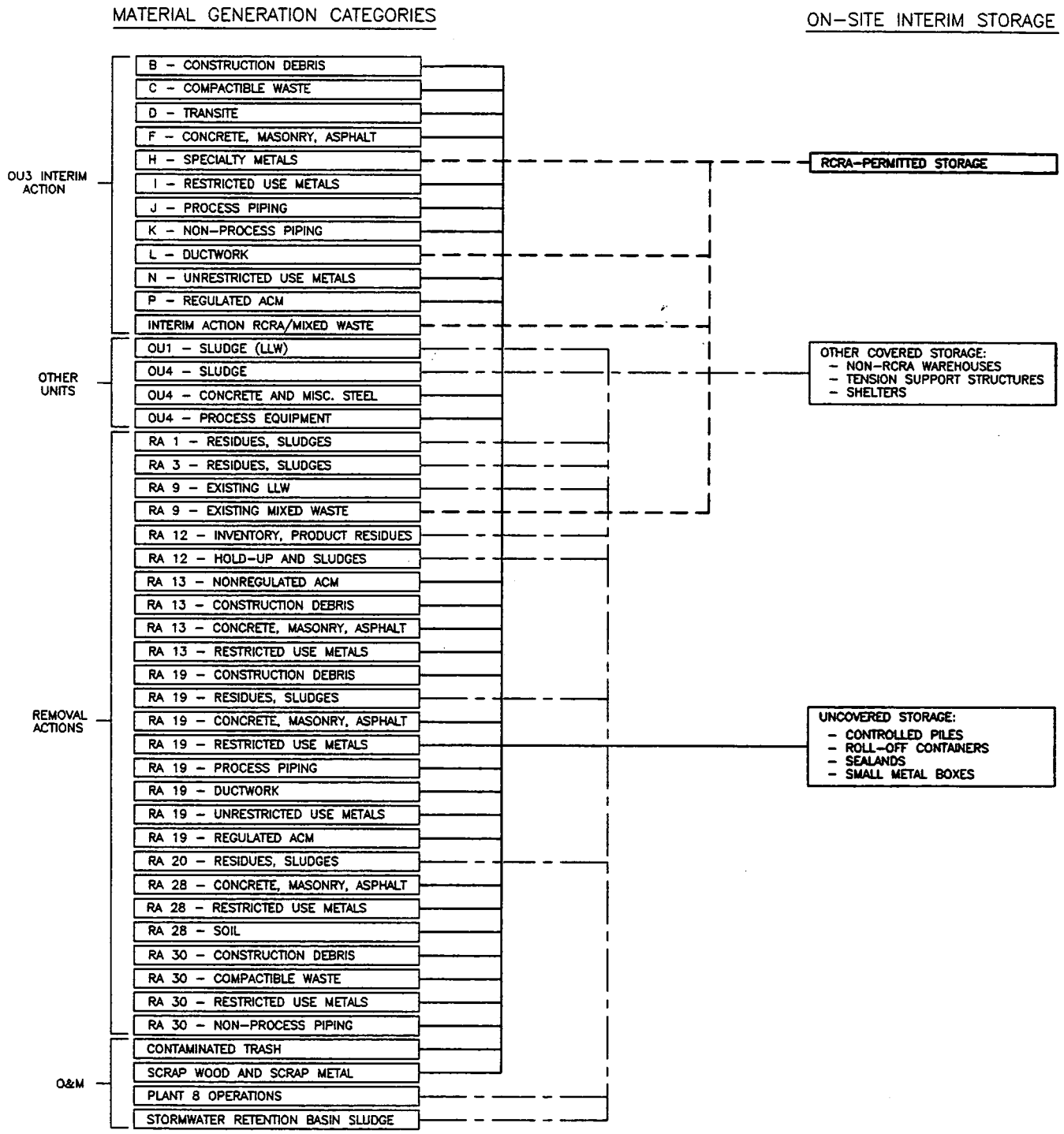

FIGURE A.4-1 Conceptual Diagram of Interim Storage Locations for Materials

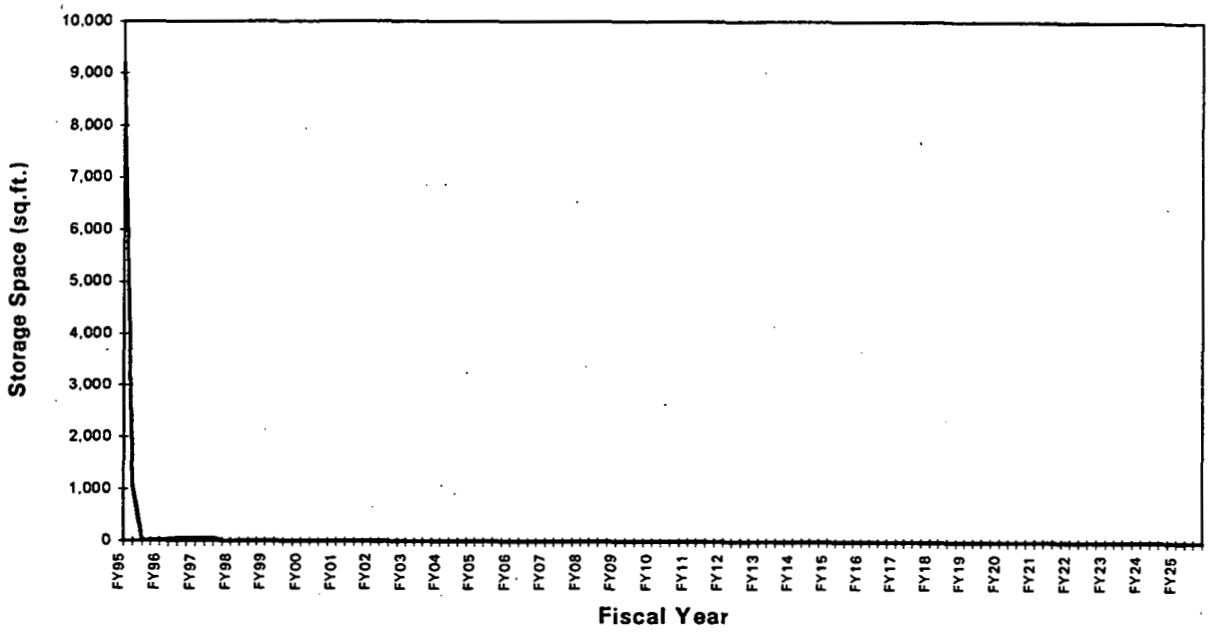

FIGURE A.4-2 Accumulation of Hazardous and Mixed Waste Requiring RCRA Storage

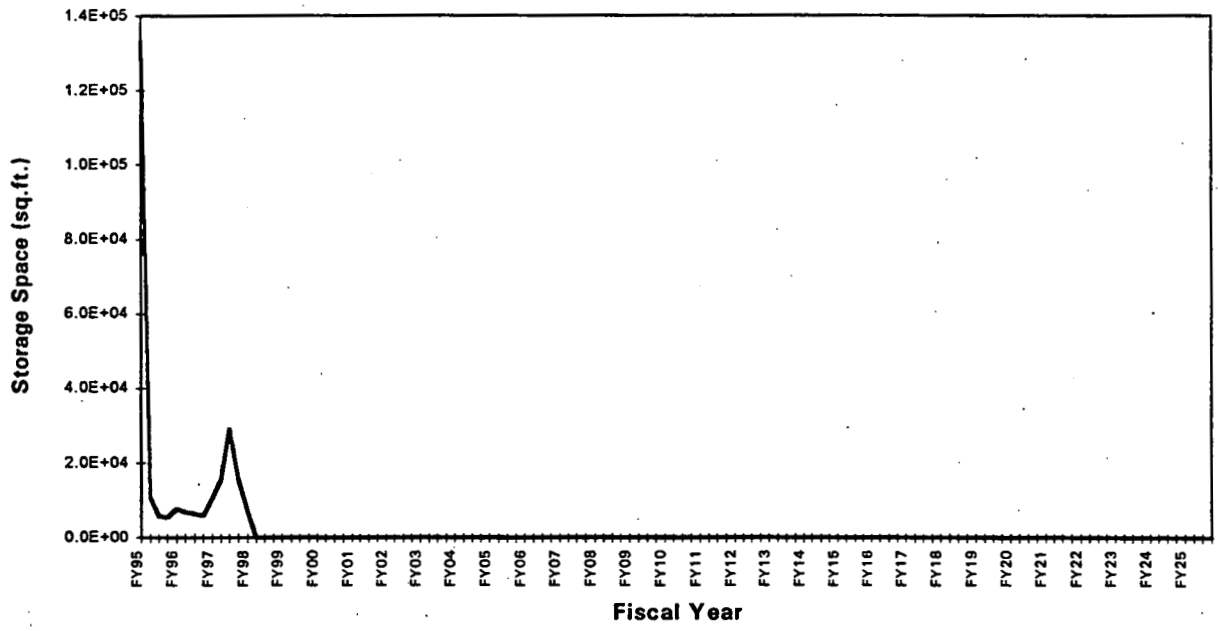

FIGURE A.4-3 Accumulation of Material Requiring Non-RCRA Covered Storage

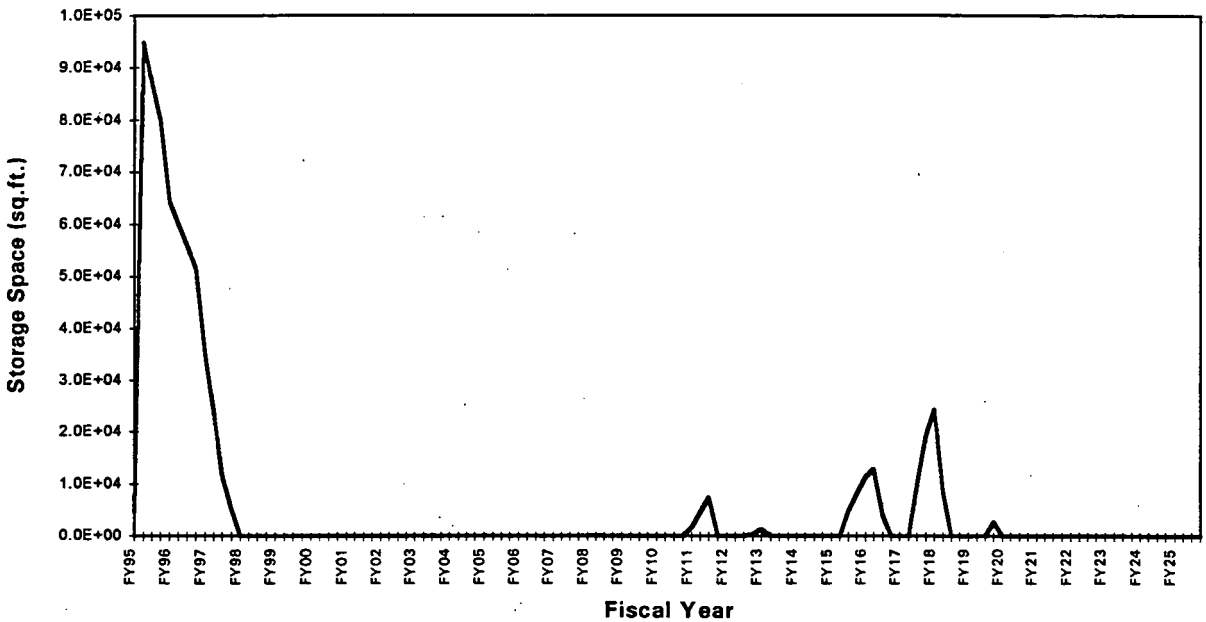

FIGURE A.4-4 Accumulation of Material Requiring Uncovered Storage

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A.5 Maximum Storage Capacities

The purpose of this section is to determine the maximum storage capacities for each of the three types of material storage facilities at the FEMP. These three types of storage facilities are hazardous and mixed waste storage facilities, non-RCRA covered storage facilities, and uncovered storage facilities. Figure A.5-1 shows where the different types of on-property storage facilities are located.

The Warehouse Utilization Plan for Fiscal Year 1994 (DOE, 1993) lists the approved on-property storage facilities and their maximum storage capacities. Some of the approved storage facilities are newer and better equipped for material storage than others. The Warehouse Utilization Plan specifies that the best available storage facilities for each material category will be filled first before lesser quality storage facilities will be used.

Each facility's maximum storage capacity is given in square footage of available floor space that is anticipated to be used for storage. This is calculated by assuming that approximately twenty-five percent of a storage facility is used for sampling, monitoring, aisle spacing between containers, and vehicle (e.g., forklift) runways. The remaining footprint within the storage facility is used in the Material Balance Model until Safe Shutdown activities begin within the facility.

A.5.1 Hazardous and Mixed Waste Storage

The hazardous waste storage facilities are active HWMUs that store hazardous and mixed waste in accordance with Ohio Administrative Code 3745-66 (40 CFR Part 265). Currently, there are 10 hazardous waste storage facilities at the FEMP. The Plant 1 Pad (74T) is the only uncovered hazardous waste storage facility and is currently being used to store LLW and nuclear material only. The Plant 1 Pad storage capacity is accounted for in Section A.5.3. Tension Support Structures (TSS) #4 and #6 are approved hazardous waste storage facilities, but are also currently being used to store only LLW and nuclear material. TSS #4 and #6 are listed later in Section A.5.2 as components that can store LLW and nuclear material. Table A.5-1 lists the remaining hazardous and mixed waste storage facilities and their maximum storage capacities. Figure A.5-2 shows the current maximum on-property storage capacity for hazardous and mixed wastes at any given time over the course of the OU3 interim remedial action.

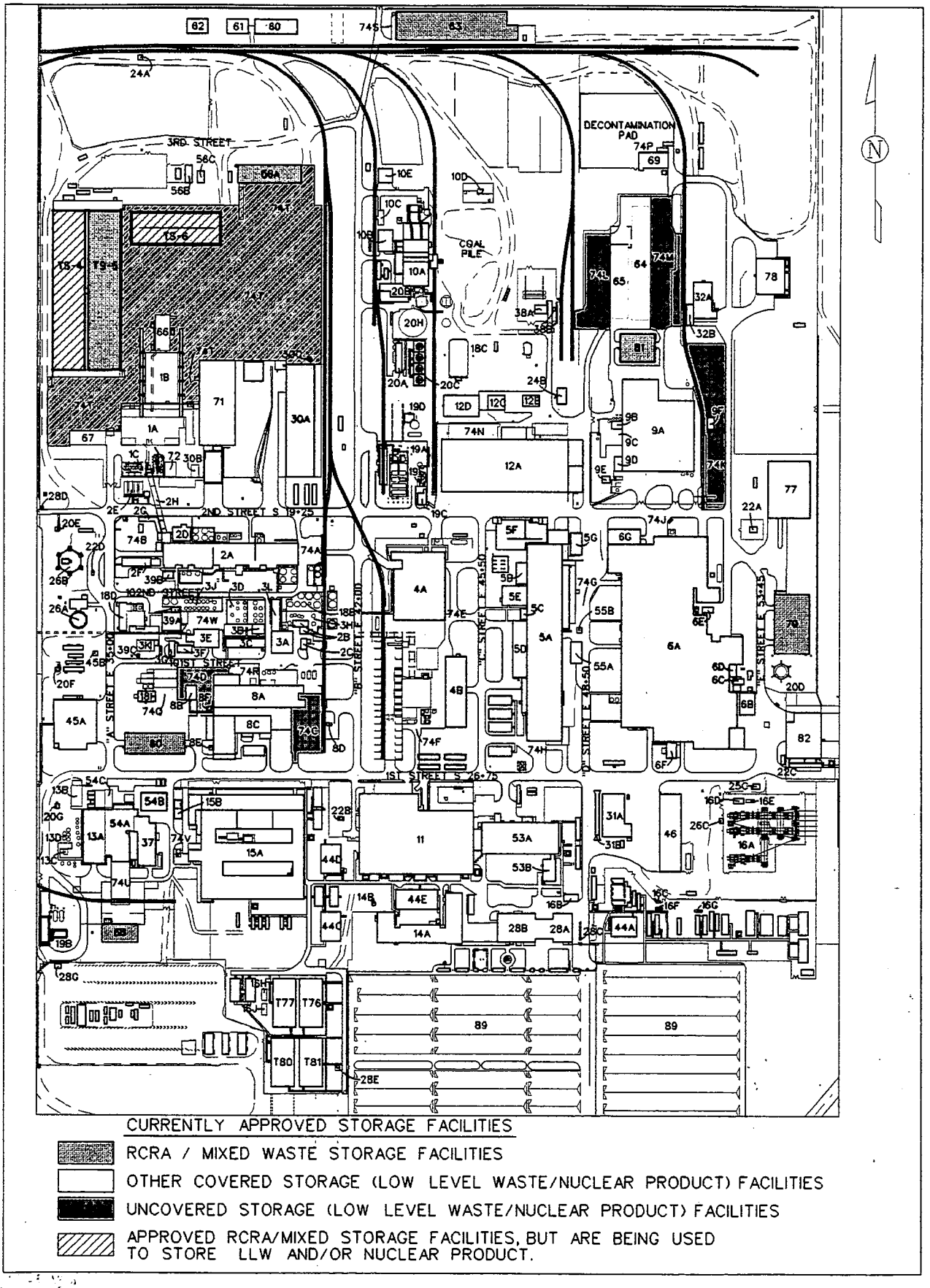

FIGURE A.5-1 Location of On-Property Storage Facilities

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TABLE A.5-1 Maximum Capacities of Hazardous and Mixed Waste Storage Facilities[1]

Storage Facility	Component Number	Maximum Storage Capacity (ft^2)
CP Warehouse	56A	6,200
KC-2 Warehouse	63	13,100
Pilot Plant Warehouse	68	3,900
Plant 6 Warehouse	79	15,100
Plant 8 Warehouse	80	7,800
Plant 9 Warehouse	81	10,900
Tension Support Structure #4	TSS-004	[2]
Tension Support Structure #5	TSS-005	30,000
Tension Support Structure #6	TSS-006	[2]
Total Hazardous and Mixed Waste Storage Capacity		87,000

[1] From Part B Permit Application
[2] See Non-RCRA Covered Storage (Table A.5-2)

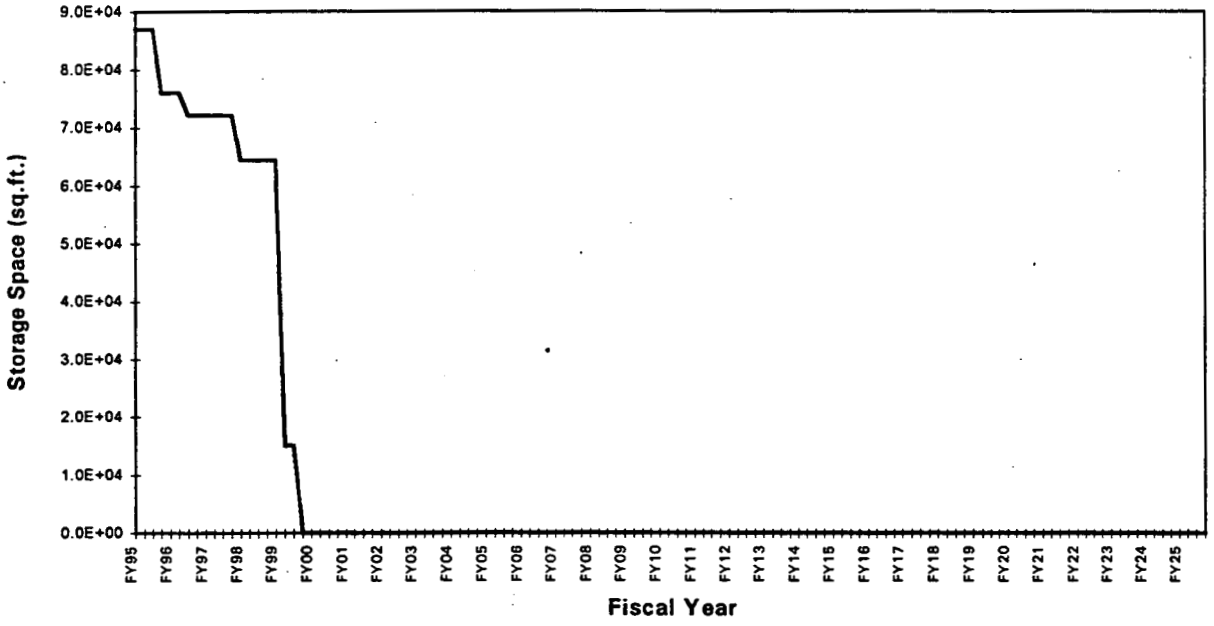

FIGURE A.5-2 Maximum On-Property Storage Capacities for Hazardous and Mixed Waste

A.5.2 Non-RCRA Covered Storage

For the purposes of this document, a covered storage facility is defined as any building, shelter, or TSS that is capable of safely storing LLW and/or nuclear material. Currently, there are 18 covered storage facilities on-property being utilized for LLW and nuclear material storage. Table A.5-2 lists the non-RCRA covered storage facilities and their maximum storage capacities. Figure A.5-3 shows the current maximum on-property, non-RCRA covered storage capacity for LLW and nuclear products at any given time over the course of the OU3 interim remedial action.

TABLE A.5-2 Maximum Capacities of Non-RCRA Covered Storage Facilities

Storage Facility	Component Number	Maximum Storage Capacity (ft^2)
Green Salt Plant	4A	3,300
Plant 4 Warehouse	4B	11,000
Metals Production Plant	5A	4,800
Plant 5 Covered Storage Pad	5F	5,700
Plant 5 Ingot Storage Shelter	5G	1,700
Metals Fabrication Plant	6A	6,000
Pilot Plant Wet Side	13A	100
Chemical Warehouse	30A	27,300
Pilot Plant Annex	37	7,800
Six to Four Reduction Facility #1	54A	800
Pilot Plant Shelter	54B	3,100
Quonset Hut #1	60	4,000
Quonset Hut #3	62	1,900
Thorium Warehouse	64	13,900
Old Plant 5 Warehouse	65	8,100
Plant 1 Thorium Warehouse	67	3,700
Finished Products Warehouse	77	16,600
Tension Support Structure #4	TSS-004	30,000
Tension Support Structure #6	TSS-006	16,900
Total Non-RCRA Covered Storage Capacity		166,700

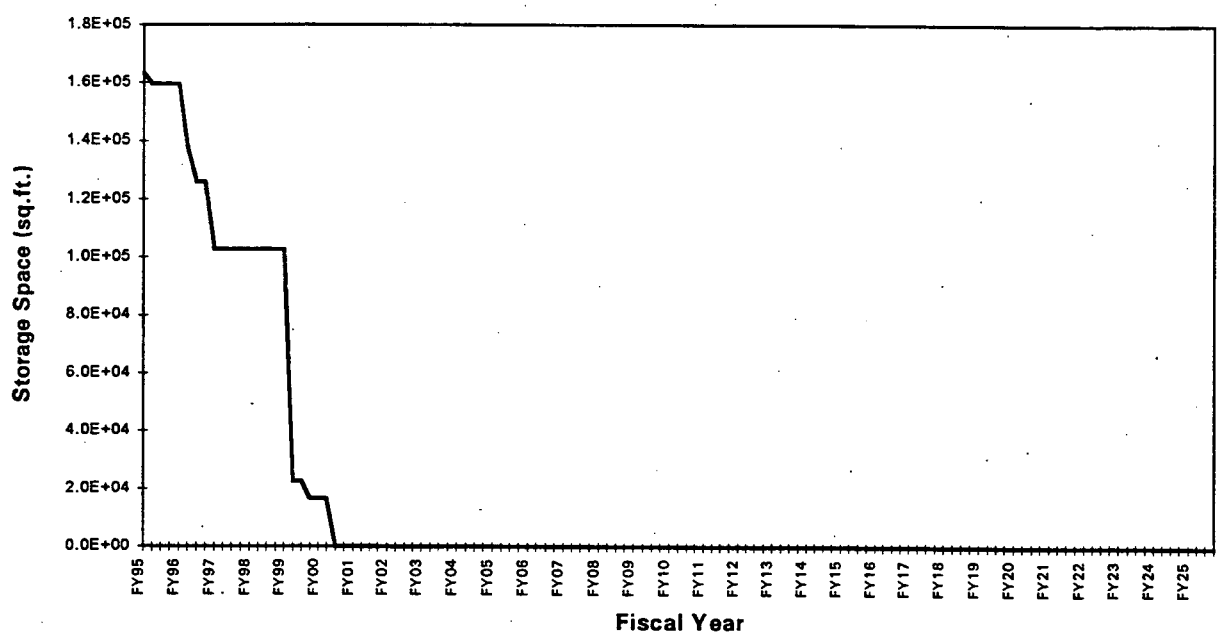

FIGURE A.5-3 Maximum On-Property Storage Capacities for Non-RCRA Covered Storage

TABLE B-2 Operable Unit 3 Bulked Material Volume Estimates (in cubic feet)

Component	Component Designation	A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Electrical Station Complex															
Main Electrical Station	16 A	0	589	143	0	2,387	0	0	14,388	0	0	0	1,637	91	19,235
Electrical Substation	16 B	0	1,918	168	0	1,149	0	3	3,511	0	0	0	49	0	6,797
Electrical Panels & Transformer	16 C	0	172	143	0	0	0	0	97	0	0	0	0	91	504
Main Electrical Switch House	16 D	0	21	143	20	986	0	0	1,843	0	0	0	44	91	3,148
Main Electrical Transformers	16 E	0	19,668	143	0	0	0	0	46	0	0	0	0	91	19,949
Trailer Substation #1	16 F	0	115	0	0	0	0	0	513	0	0	0	45	0	673
Trailer Substation #2	16 G	0	115	0	0	0	0	0	524	0	0	0	42	0	680
Main Electrical Strainer House	28 C	0	16	143	6	347	0	0	147	3	29	0	19	104	814
Engine House/Garage	31 A	0	2,074	1,673	0	5,885	0	0	2,146	20	179	0	2,113	159	14,249
Heavy Equipment Building	46	0	1,527	210	0	1,352	0	0	1,186	28	231	2	3,674	242	8,450
Electrical Station Complex Total		0	26,213	2,768	26	12,105	0	3	24,401	49	439	2	7,623	869	74,498
Sewage Treatment Plant Complex															
Chlorination Building	25 A	0	134	48	0	600	0	0	316	0	3	0	0	32	1,133
M.H.#175/Effluent Line/Sampling Building	25 B	0	24	48	0	0	0	0	553	1	6	0	0	34	666
Sewage Lift Station Building	25 C	0	74	108	0	688	0	0	361	1	6	0	66	35	1,338
U.V. Disinfection Building	25 D	0	17	48	0	435	0	0	420	5	41	0	8	41	1,014
Digester & Control Building	25 E	0	172	236	0	4,976	0	0	1,112	18	158	2	504	156	7,334
Sewage Treatment Plant Complex Total		0	422	487	0	6,700	0	0	2,762	24	213	3	578	297	11,485
Administration Complex															
Service Building	11	1,500	14,514	14,876	0	192,338	0	1	87,292	0	7,116	446	2,736	3,975	324,795
Administration Building	14 A	376	18,899	3,675	0	55,712	0	0	33,237	0	828	75	908	749	114,461
Building 14 EOC Generator Set	14 B	0	0	0	0	0	0	0	940	0	0	0	0	0	940
Security Building	28 A	0	3,952	2,324	0	10,631	0	0	2,446	0	13	32	170	118	19,687
Human Resources Building	28 B	0	5,996	1,771	0	4,157	0	0	3,065	0	38	61	3,924	228	19,240
Health & Safety Building	53 A	819	37,792	5,804	0	61,538	0	0	19,001	0	1,589	304	5,580	1,791	134,218
In-Vivo Building	53 B	0	1,503	1,403	0	0	0	0	4,409	0	64	16	408	99	7,901
Administration Complex Total		2,696	82,656	29,855	0	324,377	0	1	150,390	0	9,648	933	13,726	6,960	621,242
Miscellaneous Complex															
10-Plex North Substation	16 H	0	0	0	0	0	0	0	2,911	0	0	0	2	0	2,913
10-Plex South Substation	16 J	0	0	0	0	0	0	0	2,911	0	0	0	2	0	2,913
Clearwell Pump House	18 G	0	420	0	28	0	0	0	353	1	11	0	42	5	859
Meteorological Tower	23	0	0	0	0	0	0	0	125	0	0	0	129	0	254
10-Plex Sewage Lift Station	25 J	0	0	0	0	0	0	0	277	0	0	0	1	0	278
Guard Post on West End of 2nd Street	28 D	0	199	143	0	0	0	0	19	0	0	0	0	91	453
Guard Post East of T-81	28 E	0	24	51	0	0	0	0	15	0	0	0	25	0	116
Guard Post South of Building 51	28 G	0	17	54	0	0	0	0	25	0	0	0	14	0	110
Utility Lines	G-004	0	0	0	0	0	0	0	6,987	625	28,532	0	0	41,136	77,280
Process Trailers	G-006	0	142,271	0	0	0	0	0	0	0	0	0	0	0	142,271
Non-Process Trailers	G-007	0	610,269	0	0	0	0	0	0	0	0	0	0	0	610,269
Pipe Bridges	G-008	0	0	0	0	456	0	0	0	0	0	0	37,776	0	38,232
Miscellaneous Complex Total		0	753,200	248	28	456	0	0	13,625	626	28,543	0	37,990	41,232	875,948
Below Grade Components		6,743	54,842	0	0	5,133,447	26,385	0	713	27,898	85,573	0	162,609	0	5,498,209
Operable Unit 3 Total		20,845	1,095,557	227,525	58,029	5,842,483	26,905	97	5,434,738	35,536	201,260	6,449	989,880	128,921	14,068,226

[1] The quantities of stockpiled coal vary seasonally. No significant quantities of coal are expected to remain after the Boiler Plant/Water Plant Complex is shut down.

TABLE B–2 Operable Unit 3 Bulked Material Volume Estimates (in cubic feet)

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Plant 5 Complex															
Plant 4 Warehouse	4 B	0	386	359	0	0	0	0	1,039	0	312	0	2,767	356	5,219
Metals Production Plant	5 A	2,703	9,480	15,117	6,409	25,016	0	6	659,577	564	5,074	909	84,962	6,614	816,431
Plant 5 Ingot Pickling	5 B	0	103	287	0	0	0	0	9,614	12	108	0	981	258	11,364
Plant 5 Electrical Substation	5 C	0	88	167	0	0	0	0	2,555	17	155	0	136	191	3,310
West Derby Breakout/ Slag Milling	5 D	0	233	932	0	290	0	0	84,390	70	633	15	25,941	1,068	113,574
Plant 5 Filter Building	5 E	0	343	187	0	0	0	0	231	0	0	0	635	106	1,483
Plant 5 Covered Storage Pad	5 F	0	290	186	0	0	0	0	783	0	0	0	2,391	118	3,769
Plant 5 Ingot Storage Shelter	5 G	0	50	53	0	0	0	0	139	0	0	0	426	33	701
Slag Recycling Building	55 A	0	1,073	2,039	601	0	0	0	23,418	2	16	32	5,178	465	32,823
Slag Recycling Pit/Elevator	55 B	0	8	172	120	0	0	0	1,755	4	38	11	934	162	3,203
Plant 5 Complex Total		2,703	12,056	19,479	7,130	25,306	0	6	783,500	669	6,336	967	124,351	9,372	991,876
Plant 6 Complex															
Metals Fabrication Plant	6 A	180	14,123	1,111	12,724	11,248	0	0	704,741	708	6,374	604	91,068	5,154	848,033
Plant 6 Covered Storage Area	6 B	0	0	124	0	0	0	0	16	0	37	9	736	129	1,051
Plant 6 Electrostatic Precipitator (South)	6 C	0	0	186	0	0	0	0	191	4	37	16	204	196	835
Plant 6 Electrostatic Precipitator (Central)	6 D	0	0	148	0	0	0	0	74	0	25	16	102	159	525
Plant 6 Electrostatic Precipitator (North)	6 E	0	0	186	0	0	0	0	2,124	4	36	16	204	192	2,762
Plant 6 Salt Oil Heat Treat Building	6 F	0	48	325	0	0	0	0	5,246	185	1,668	7	341	1,002	8,823
Plant 6 Sump Building	6 G	0	183	2,268	29	281	0	0	32,593	188	1,694	0	6,161	875	44,272
Plant 6 Complex Total		180	14,354	4,349	12,753	11,529	0	0	744,985	1,090	9,871	668	98,817	7,706	906,301
Liquid Storage Complex															
Methanol Tank	18 J	0	0	24	0	421	0	0	100	0	39	0	307	35	926
Low Nitrate Tank	18 K	0	120	24	0	0	0	0	1,360	0	14	0	136	19	1,673
High Nitrate Tank	18 L	0	120	29	0	0	0	0	1,360	0	14	0	136	22	1,681
Well House #1	20 E	0	109	115	0	389	0	0	168	3	27	0	0	80	892
Well House #2	20 F	0	109	115	0	391	0	0	210	3	27	0	0	80	935
Well House #3	20 G	0	184	115	0	514	0	0	1,287	0	0	0	26	73	2,199
Gas Meter Building	22 A	0	90	115	0	753	0	0	86	3	23	0	27	78	1,174
Storm Sewer Lift Station	22 B	0	12	115	0	331	0	0	854	6	52	3	38	101	1,513
Scale House & Weigh Scale	22 D	0	0	115	19	0	0	0	50	0	0	0	53	73	309
Pump House – HP Fire Protection	26 A	0	390	404	0	7,557	0	0	1,437	31	279	0	2,808	154	13,060
Elevated Water Storage Tank	26 B	0	0	163	0	702	0	0	433	0	710	0	29,447	265	31,719
Rust Engineering Building	45 A	0	1,772	406	0	3,934	0	0	7,016	0	419	99	2,824	752	17,221
Utility Shed East of Rust Trailers	45 B	0	155	115	0	0	0	0	8	0	0	0	0	73	350
Liquid Storage Complex Total		0	3,062	1,852	19	14,992	0	0	14,370	45	1,603	102	35,803	1,805	73,653
Pilot Plant Complex															
Pilot Plant Wet Side	13 A	0	3,984	2,555	451	13,557	0	1	58,070	335	3,015	24	2,834	1,827	86,654
Pilot Plant Maintenance Building	13 B	0	724	463	0	4,376	0	0	584	6	52	0	197	107	6,509
Sump Pump House	13 C	0	103	110	0	433	0	0	967	10	94	1	68	142	1,928
Pilot Plant Thorium Tank Farm	13 D	0	0	258	0	0	0	0	33,288	0	173	0	0	260	33,980
Pilot Plant Annex	37	0	1,317	1,499	0	8,060	0	0	39,419	60	538	0	2,410	401	53,703
Six to Four Reduction Facility #1	54 A	0	3,444	4,886	267	13,622	0	3	97,062	83	751	115	9,458	1,939	131,630
Pilot Plant Shelter	54 B	0	57	889	0	0	0	0	343	0	0	0	409	565	2,262
Pilot Plant Dissociator Shelter	54 C	0	27	24	0	0	0	0	5,681	17	149	0	409	83	6,390
Pilot Plant Warehouse	68	0	444	325	431	1,053	0	0	1,145	0	0	0	2,577	206	6,182
Pilot Plant Complex Total		0	10,100	11,009	1,149	41,101	0	5	236,559	511	4,770	141	18,363	5,530	329,238
Laboratory Complex															
Laboratory	15 A	0	36,703	16,863	50	110,260	0	0	104,810	990	8,910	1,073	14,910	8,879	303,449
Laboratory Chemical Storage Building	15 B	0	25	5	0	1,129	0	0	1,818	0	21	7	221	41	3,267
Laboratory Complex Total		0	36,728	16,868	50	111,389	0	0	106,627	990	8,932	1,080	15,131	8,920	306,716

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TABLE B-2 Operable Unit 3 Bulked Material Volume Estimates (in cubic feet)

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Maintenance Complex															
Main Maintenance Building	12 A	180	9,135	18,966	5,556	34,520	0	0	31,020	41	365	98	24,282	1,180	125,343
Cylinder Storage Building	12 B	0	294	478	0	2,023	0	0	418	0	0	0	215	115	3,543
Lumber Storage Building	12 C	0	224	100	0	0	0	0	137	0	0	0	409	64	934
Maintenance Building Warehouse	12 D	0	194	1,901	0	0	0	0	483	0	208	0	893	213	3,892
Railroad Engine House	24 B	0	333	412	0	2,253	0	0	332	3	23	0	208	121	3,684
Propane Storage	38 A	0	187	253	0	1,847	0	0	274	71	643	0	180	374	3,830
Cylinder Filling Station	38 B	0	13	335	0	0	0	0	6,952	0	21	0	27	229	7,576
Maintenance Complex Total		180	10,381	22,446	5,556	40,644	0	0	39,617	115	1,259	98	26,212	2,295	148,802
East Warehouses Complex															
Elevated Potable Storage Tank	20 D	0	0	416	0	0	0	0	216	0	324	0	8,698	141	9,796
Finished Products Warehouse (4A Warehouse)	77	0	219	163	0	0	0	0	1,221	0	787	0	3,430	352	6,172
Plant 6 Warehouse	79	0	268	115	0	0	0	0	1,260	0	544	0	2,855	258	5,300
Receiving/Incoming Materials Inspection	82	0	1,117	115	0	3,120	0	0	2,145	17	151	27	2,045	252	8,989
East Warehouses Complex Total		0	1,604	808	0	3,120	0	0	4,842	17	1,806	27	17,028	1,003	30,256
Plant 3 Complex															
Ozone Building	3 B	0	50	215	143	0	0	0	84	2	19	0	511	145	1,169
NAR Control House	3 C	0	250	1,850	488	0	0	0	27,229	0	250	0	1,193	357	31,618
NAR Towers	3 D	0	40	765	22	0	0	0	141,649	0	2,728	0	6,353	1,325	152,882
Hot Raffinate Building	3 E	0	680	774	652	7,722	0	0	86,049	78	698	22	3,258	915	100,846
Harshaw Digestion Fume Recovery	3 F	0	0	234	0	0	0	0	3,706	0	142	1	2,045	221	6,349
Refrigeration Building	3 G	0	30	637	156	0	0	1	3,427	3	24	0	348	120	4,746
Combined Raffinate Tanks	3 J	0	40	545	0	0	0	0	56,514	0	376	0	1,677	551	59,703
Old Cooling Water Tower	3 K	0	0	234	0	101	0	0	125	0	0	0	0	149	610
Incinerator Building	39 A	173	433	992	578	0	0	0	622	33	301	0	3,106	377	6,617
Incinerator Sprinkler Riser House	39 C	0	22	100	0	313	0	0	1,090	0	4	0	38	68	1,637
Plant 3 Complex Total		173	1,546	6,347	2,039	8,136	0	1	320,496	116	4,543	23	18,528	4,228	366,177
Plant 2 Complex															
Ore Refinery Plant	2 A	9	6,821	10,111	4,868	11,556	520	22	527,719	276	2,482	419	62,089	3,252	630,144
Metal Dissolver Building	2 D	0	663	1,860	417	0	0	0	32,926	24	216	2	2,239	567	38,914
NFS Storage and Pump House	2 E	0	63	277	0	674	0	0	24,061	0	562	0	49	481	26,167
Cold Side Ore Conveyor	2 F	0	55	239	109	0	0	0	21,293	0	14	2	743	170	22,624
Hot Side Ore Conveyor	2 G	0	38	201	74	0	0	0	27,691	0	78	0	654	164	28,899
Waste Oil Decant Shelter	39 B	0	0	76	0	0	0	0	60	1	8	0	409	57	611
Plant 2 Complex Total		9	7,641	12,764	5,468	12,229	520	22	633,750	301	3,359	423	66,183	4,690	747,361
Plant 8 Complex															
Recovery Plant	8 A	0	10,871	13,973	4,091	9,235	0	8	224,793	1,063	9,565	209	39,220	5,634	318,662
Plant 8 Maintenance Building	8 B	0	1,326	335	0	3,185	0	0	208	5	45	0	563	241	5,908
Rotary Kiln/Drum Reconditioning	8 C	0	3,983	5,926	0	4,940	0	0	132,520	6	56	65	26,009	528	174,035
Plant 8 Railroad Filter Building	8 D	0	7	57	0	0	0	0	78	5	44	0	68	53	312
Drum Conveyor Shelter	8 E	0	0	57	0	0	0	0	110	0	0	0	399	36	603
Plant 8 Old Drum Washer	8 F	0	0	38	0	0	0	0	0	0	0	5	0	40	84
Plant 8 Warehouse	80	0	128	464	0	0	0	0	647	0	212	0	1,705	367	3,522
Plant 8 Complex Total		0	16,316	20,851	4,091	17,360	0	8	358,357	1,079	9,921	279	67,964	6,899	503,124
General Sump Complex															
General/Refinery Sump Control Building	2 B	0	347	1,399	206	230	0	1	24,747	2	20	0	1,885	307	29,144
Bulk Lime Handling Building	2 C	0	230	167	109	0	0	0	7,751	23	209	0	511	162	9,164
Maintenance Building	3 A	0	303	1,965	528	0	0	0	33,515	12	106	0	1,595	336	38,361
Refinery Sump	3 H	0	40	445	0	0	0	0	44,534	0	470	0	1,084	543	47,116
Electrical Power Center Building	3 L	0	177	1,370	332	0	0	0	20,873	1	8	0	852	277	23,888
General Sump	18 B	0	240	736	0	0	0	0	4,818	0	931	4	1,084	918	8,731
Biodenitrification Towers	18 D	0	1,964	3,931	0	0	0	0	21,712	54	483	10	9,304	767	38,225
BDN Effluent Treatment Facility	18 H	0	147	849	0	0	0	0	131,546	8	68	0	149	272	133,038
General Sump Complex Total		0	3,448	10,862	1,176	230	0	1	289,497	99	2,293	14	16,464	3,584	327,667

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TABLE B-2 Operable Unit 3 Bulked Material Volume Estimates (in cubic feet)

Component	Component Designation	A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Building 4A															
Green Salt Plant	4 A	687	6,552	10,783	5,608	0	0	26	308,234	418	3,759	266	97,590	3,463	437,387
External Complex															
Skeet Range Building	28 F	0	25	0	0	0	0	0	38	0	0	0	0	0	63
Sewage Treatment Plant Incinerator	39 D	299	0	134	47	263	0	0	2,192	0	21	0	162	93	3,211
Decontamination Building	69	0	1,179	1,166	0	7,313	0	0	470	52	471	0	2,599	464	13,714
External Complex Total		299	1,204	1,300	47	7,576	0	0	2,700	52	492	0	2,761	558	16,989
Thorium/Plant 9 Complex															
Special Products Plant	9 A	0	4,852	13,524	4,319	303	0	6	241,220	187	1,681	733	33,569	4,042	304,438
Plant 9 Sump Treatment Facility	9 B	0	156	545	193	105	0	0	2,762	28	255	1	559	185	4,791
Plant 9 Dust Collector	9 C	0	0	38	0	0	0	0	87	0	43	7	102	56	332
Plant 9 Substation	9 D	0	43	832	265	0	0	0	335	0	0	0	293	39	1,808
Plant 9 Cylinder Shed	9 E	0	0	19	7	0	0	0	0	0	0	0	14	12	52
Electrostatic Precipitator	9 F	0	10	57	15	0	0	0	161	4	37	0	68	61	414
Magnesium Storage Building	32 A	0	1,607	1,287	0	6,530	0	0	504	0	161	5	1,658	161	11,913
Building 32 Covered Loading Dock	32 B	0	185	241	0	0	0	0	65	0	0	0	290	12	793
Thorium Warehouse	64	0	3,099	330	15	1,560	0	5	3,416	0	436	0	3,297	296	12,453
(Old) Plant 5 Warehouse	65	0	1,832	110	0	0	0	4	854	0	490	0	4,497	214	8,001
D & D Building	78	0	3,914	3,791	0	10,608	0	0	15,518	42	379	0	3,985	350	38,587
Plant 9 Warehouse	81	0	128	143	0	0	0	0	689	0	307	0	1,347	195	2,809
Thorium/Plant 9 Complex Total		0	15,827	20,918	4,814	19,107	0	15	265,611	261	3,789	745	49,678	5,624	386,390
Boiler Plant/Water Plant Complex															
Boiler Plant	10 A	6,397	5,354	574	1,657	7,124	0	4	210,546	203	1,828	26	30,059	1,510	265,283
Boiler Plant Maintenance Building	10 B	0	278	86	7	754	0	0	514	3	28	0	687	83	2,441
Wet Salt Storage Bin	10 C	0	0	148	0	2,077	0	0	58	1	8	0	120	98	2,511
Utilities Heavy Equipment Building	10 E	0	139	448	0	0	0	0	193	1	9	0	204	38	1,033
Pump Station & Power Center	20 A	0	326	776	243	0	0	0	264	116	1,041	0	930	346	4,041
Water Plant	20 B	0	1,043	1,384	197	426	0	0	13,138	348	3,128	7	3,738	1,058	24,468
Cooling Towers	20 C	0	9,680	158	521	0	0	0	614,077	0	936	0	380	341	626,093
Process Water Storage Tank	20 H	0	0	1,114	0	10,530	0	0	0	0	94	0	0	727	12,465
Railroad Scale House	24 A	0	108	19	0	468	0	0	1	0	0	0	0	12	608
Coal Pile [1]	P-005	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boiler Plant/Water Plant Complex Total		6,397	16,930	4,706	2,625	21,380	0	5	838,792	671	7,073	32	36,118	4,214	938,944
Tank Farm Complex															
Main Tank Farm	19 A	0	80	392	0	3,159	0	0	72,551	0	530	0	3,694	558	80,965
Tank Farm Control House	19 C	0	279	546	0	1,690	0	0	1,157	0	0	0	204	55	3,931
Old North Tank Farm	19 D	0	0	373	0	632	0	0	41,585	0	0	0	0	237	42,827
Tank Farm Lime Slitter Building	19 E	0	54	124	0	0	0	0	2,146	1	10	0	461	87	2,884
Tank Farm Complex Total		0	413	1,435	0	5,481	0	0	117,440	1	540	0	4,360	936	130,606
Plant 1 Complex															
Preparation Plant	1 A	11	2,077	11,020	3,201	6,524	0	3	146,085	455	4,100	633	27,497	5,161	206,766
Plant 1 Storage Shelter	1 B	0	250	253	0	0	0	0	350	0	0	0	2,077	161	3,091
Chemical Warehouse	30 A	0	3,002	2,383	2,095	416	0	3	1,735	0	873	0	10,361	668	21,536
Drum Storage Warehouse	30 B	0	147	124	0	0	0	0	107	0	11	0	136	83	607
CP Storage Warehouse	56 A	0	1,485	306	7	0	0	0	618	0	232	0	2,237	283	5,168
Storage Shed (West)	56 B	0	313	196	0	0	0	0	14	0	0	0	0	124	648
Storage Shed (East)	56 C	0	433	148	0	0	0	0	22	0	0	0	0	94	698
Quonset Hut #1	60	0	136	57	0	0	0	0	358	0	0	0	773	36	1,361
Quonset Hut #2	61	0	152	72	0	0	0	0	188	0	0	0	412	46	870
Quonset Hut #3	62	666	152	38	0	0	0	0	189	0	0	0	412	24	1,482
KC-2 Warehouse	63	100	5,048	5,762	0	11,889	0	0	1,606	0	640	0	6,199	424	31,669
Drum Reconditioning Building	66	0	389	588	11	0	0	0	19,963	49	443	13	849	507	22,812
Plant 1 Thorium Warehouse	67	0	430	325	0	0	0	0	366	0	0	0	1,953	206	3,280
General In-Process Warehouse	71	0	4,474	5,332	0	6,989	0	0	1,247	0	189	0	3,858	416	22,504
Drum Storage Building	72	0	108	296	136	0	0	0	134	0	9	0	855	192	1,730
Tension Support Structure #4	TS-004	0	607	210	0	0	0	0	2,150	0	0	0	6,816	134	9,917
Tension Support Structure #5	TS-005	0	673	210	0	0	0	0	2,150	0	0	0	6,816	134	9,983
Tension Support Structure #6	TS-006	0	187	67	0	0	0	0	187	0	0	0	750	42	1,234
Plant 1 Complex Total		777	20,063	27,389	5,450	25,818	0	5	177,469	505	6,497	646	72,002	8,734	345,356

TABLE B-1 Operable Unit 3 Unbulked Material Volume Estimates (in cubic feet)

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Electrical Station Complex															
Main Electrical Station	16 A	0	294	120	0	1,836	0	0	4,152	0	0	0	98	23	6,523
Electrical Substation	16 B	0	959	140	0	884	0	1	1,013	0	0	0	3	0	3,000
Electrical Panels & Transformer	16 C	0	86	120	0	0	0	0	28	0	0	0	0	23	257
Main Electrical Switch House	16 D	0	11	120	16	758	0	0	532	0	0	0	3	23	1,462
Main Electrical Transformers	16 E	0	9,834	120	0	0	0	0	13	0	0	0	0	23	9,990
Trailer Substation #1	16 F	0	57	0	0	0	0	0	148	0	0	0	3	0	208
Trailer Substation #2	16 G	0	57	0	0	0	0	0	151	0	0	0	2	0	211
Main Electrical Strainer House	26 C	0	8	120	5	267	0	0	43	2	15	0	1	26	485
Engine House/Garage	31 A	0	1,037	1,394	0	4,527	0	0	619	10	89	0	127	40	7,843
Heavy Equipment Building	46	0	763	175	0	1,040	0	0	342	13	115	1	220	60	2,731
Electrical Station Complex Total		0	13,107	2,307	21	9,312	0	1	7,041	24	219	1	456	217	32,708
Sewage Treatment Plant Complex															
Chlorination Building	25 A	0	67	40	0	462	0	0	91	0	1	0	0	8	669
M.H.#175/Effluent Line/Sampling Building	25 B	0	12	40	0	0	0	0	160	0	3	0	0	8	223
Sewage Lift Station Building	25 C	0	37	90	0	529	0	0	104	0	3	0	4	9	776
U.V. Disinfection Building	25 D	0	9	40	0	335	0	0	121	2	20	0	0	10	538
Digester & Control Building	25 E	0	86	197	0	3,828	0	0	321	9	79	1	30	39	4,590
Sewage Treatment Plant Complex Total		0	211	406	0	5,153	0	0	797	12	106	1	35	74	6,796
Administration Complex															
Service Building	11	750	7,257	12,397	0	147,952	0	0	25,189	0	3,558	223	164	994	198,485
Administration Building	14 A	188	9,450	3,063	0	42,856	0	0	9,591	0	414	37	54	187	65,841
Building 14 EOC Generator Set	14 B	0	0	0	0	0	0	0	271	0	0	0	0	0	271
Security Building	28 A	0	1,976	1,937	0	8,178	0	0	706	0	6	16	10	29	12,859
Human Resources Building	28 B	0	2,998	1,476	0	3,198	0	0	884	0	19	30	235	57	8,897
Health & Safety Building	53 A	410	18,896	4,837	0	47,337	0	0	5,483	0	794	152	334	448	78,691
In-Vivo Building	53 B	0	751	1,169	0	0	0	0	1,272	0	32	8	24	25	3,282
Administration Complex Total		1,349	41,328	24,879	0	249,521	0	0	43,397	0	4,824	466	822	1,740	368,326
Miscellaneous Complex															
10-Plex North Substation	16 H	0	0	0	0	0	0	0	840	0	0	0	0	0	840
10-Plex South Substation	16 J	0	0	0	0	0	0	0	840	0	0	0	0	0	840
Clearwell Pump House	18 G	0	210	0	23	0	0	0	102	1	5	0	2	1	345
Meteorological Tower	23	0	0	0	0	0	0	0	36	0	0	0	8	0	44
10-Plex Sewage Lift Station	25 J	0	0	0	0	0	0	0	80	0	0	0	0	0	80
Guard Post on West End of 2nd Street	28 D	0	99	120	0	0	0	0	6	0	0	0	0	23	247
Guard Post East of T-81	28 E	0	12	43	0	0	0	0	4	0	0	0	2	0	61
Guard Post South of Building 51	28 G	0	9	45	0	0	0	0	7	0	0	0	1	0	61
Utility Lines	G-004	0	0	0	0	0	0	0	2,016	312	14,266	0	0	10,284	26,878
Process Trailers	G-006	0	71,136	0	0	0	0	0	0	0	0	0	0	0	71,136
Non-Process Trailers	G-007	0	305,136	0	0	0	0	0	0	0	0	0	0	0	305,136
Pipe Bridges	G-008	0	0	0	0	351	0	0	0	0	0	0	2,262	0	2,613
Miscellaneous Complex Total		0	376,602	207	23	351	0	0	3,932	313	14,271	0	2,275	10,308	408,261
Below Grade Components		3,373	27,421	0	0	3,948,806	20,292	0	206	13,949	42,785	0	9,737	0	4,066,569
Operable Unit 3 Total		10,427	547,782	189,605	48,358	4,494,218	20,692	49	1,568,260	17,768	100,628	3,224	59,274	32,230	7,092,514

[1] The quantities of stockpiled coal vary seasonally. No significant quantities of coal are expected to remain after the Boiler Plant/Water Plant Complex is shut down.

TABLE B–1 Operable Unit 3 Unbulked Material Volume Estimates (in cubic feet)

Component	Component Designation	A Non–Reg., Non–Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non–Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Plant 5 Complex															
Plant 4 Warehouse	4 B	0	193	299	0	0	0	0	300	0	156	0	166	89	1,203
Metals Production Plant	5 A	1,352	4,740	12,597	5,341	19,243	0	3	190,329	282	2,537	454	5,088	1,653	243,620
Plant 5 Ingot Pickling	5 B	0	52	239	0	0	0	0	2,774	6	54	0	59	65	3,248
Plant 5 Electrical Substation	5 C	0	44	139	0	0	0	0	737	9	78	0	8	48	1,063
West Derby Breakout/ Slag Milling	5 D	0	117	777	0	223	0	0	24,352	35	317	8	1,553	267	27,648
Plant 5 Filter Building	5 E	0	172	139	0	0	0	0	67	0	0	0	38	27	442
Plant 5 Covered Storage Pad	5 F	0	145	155	0	0	0	0	226	0	0	0	143	30	699
Plant 5 Ingot Storage Shelter	5 G	0	25	44	0	0	0	0	40	0	0	0	26	8	143
Slag Recycling Building	55 A	0	537	1,699	501	0	0	0	6,757	1	8	16	310	116	9,945
Slag Recycling Pit/Elevator	55 B	0	4	143	100	0	0	0	506	2	19	5	56	40	877
Plant 5 Complex Total		1,352	6,028	16,233	5,942	19,466	0	3	226,089	335	3,168	483	7,446	2,343	288,888
Plant 6 Complex															
Metals Fabrication Plant	6 A	90	7,061	925	10,603	8,652	0	0	203,362	354	3,187	302	5,453	1,288	241,278
Plant 6 Covered Storage Area	6 B	0	0	104	0	0	0	0	4	0	19	4	44	32	207
Plant 6 Electrostatic Precipitator (South)	6 C	0	0	155	0	0	0	0	55	2	19	8	12	49	300
Plant 6 Electrostatic Precipitator (Central)	6 D	0	0	123	0	0	0	0	21	0	13	8	6	40	211
Plant 6 Electrostatic Precipitator (North)	6 E	0	0	155	0	0	0	0	613	2	18	8	12	48	856
Plant 6 Salt Oil Heat Treat Building	6 F	0	24	271	0	0	0	0	1,514	93	834	4	20	251	3,010
Plant 6 Sump Building	6 G	0	91	1,890	24	216	0	0	9,405	94	847	0	369	219	13,156
Plant 6 Complex Total		90	7,177	3,624	10,628	8,868	0	0	214,974	545	4,936	334	5,917	1,927	259,019
Liquid Storage Complex															
Methanol Tank	18 J	0	0	20	0	324	0	0	29	0	19	0	18	9	419
Low Nitrate Tank	18 K	0	60	20	0	0	0	0	392	0	7	0	8	5	492
High Nitrate Tank	18 L	0	60	24	0	0	0	0	392	0	7	0	8	6	497
Well House #1	20 E	0	55	96	0	299	0	0	49	2	14	0	0	20	533
Well House #2	20 F	0	54	96	0	301	0	0	61	2	14	0	0	20	546
Well House #3	20 G	0	92	96	0	395	0	0	371	0	0	0	2	18	974
Gas Meter Building	22 A	0	45	96	0	579	0	0	25	1	11	0	2	20	779
Storm Sewer Lift Station	22 B	0	6	96	0	255	0	0	247	3	26	2	2	25	661
Scale House & Weigh Scale	22 D	0	0	96	16	0	0	0	14	0	0	0	3	18	147
Pump House–HP Fire Protection	26 A	0	195	337	0	5,813	0	0	415	16	139	0	168	39	7,121
Elevated Water Storage Tank	26 B	0	0	135	0	540	0	0	125	0	355	0	1,763	66	2,985
Rust Engineering Building	45 A	0	886	339	0	3,026	0	0	2,024	0	209	49	169	188	6,891
Utility Shed East of Rust Trailers	45 B	0	78	96	0	0	0	0	2	0	0	0	0	18	194
Liquid Storage Complex Total		0	1,531	1,544	16	11,532	0	0	4,147	23	802	51	2,144	451	22,240
Pilot Plant Complex															
Pilot Plant Wet Side	13 A	0	1,992	2,129	376	10,429	0	1	16,757	167	1,507	12	170	457	33,997
Pilot Plant Maintenance Building	13 B	0	362	386	0	3,366	0	0	169	3	26	0	12	27	4,350
Sump Pump House	13 C	0	52	92	0	333	0	0	279	5	47	1	4	35	848
Pilot Plant Thorium Tank Farm	13 D	0	0	215	0	0	0	0	9,606	0	86	0	0	65	9,972
Pilot Plant Annex	37	0	658	1,249	0	6,200	0	0	11,375	30	269	0	144	100	20,026
Six to Four Reduction Facility #1	54 A	0	1,722	4,071	222	10,478	0	2	28,008	42	375	58	566	485	46,030
Pilot Plant Shelter	54 B	0	28	741	0	0	0	0	99	0	0	0	24	141	1,034
Pilot Plant Dissociator Shelter	54 C	0	13	20	0	0	0	0	1,639	8	74	0	24	21	1,801
Pilot Plant Warehouse	68	0	222	271	359	810	0	0	330	0	0	0	154	52	2,199
Pilot Plant Complex Total		0	5,050	9,174	958	31,616	0	2	68,262	255	2,385	71	1,100	1,383	120,256
Laboratory Complex															
Laboratory	15 A	0	18,352	14,053	42	84,815	0	0	30,244	495	4,455	537	893	2,220	156,105
Laboratory Chemical Storage Building	15 B	0	13	4	0	869	0	0	524	0	11	3	13	10	1,448
Laboratory Complex Total		0	18,364	14,057	42	85,684	0	0	30,769	495	4,466	540	906	2,230	157,552

TABLE B-1 Operable Unit 3 Unbulked Material Volume Estimates (in cubic feet)

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Maintenance Complex															
Main Maintenance Building	12 A	90	4,568	15,805	4,630	26,554	0	0	8,951	20	182	49	1,454	295	62,598
Cylinder Storage Building	12 B	0	147	399	0	1,558	0	0	121	0	0	0	13	29	2,264
Lumber Storage Building	12 C	0	112	84	0	0	0	0	40	0	0	0	24	16	276
Maintenance Building Warehouse	12 D	0	97	1,584	0	0	0	0	139	0	104	0	53	53	2,031
Railroad Engine House	24 B	0	167	343	0	1,733	0	0	96	1	12	0	12	30	2,395
Propane Storage	38 A	0	93	211	0	1,421	0	0	79	36	321	0	11	93	2,266
Cylinder Filling Station	38 B	0	7	279	0	0	0	0	2,006	0	11	0	2	57	2,361
Maintenance Complex Total		90	5,190	18,705	4,630	31,264	0	0	11,432	57	630	49	1,570	574	74,191
East Warehouses Complex															
Elevated Potable Storage Tank	20 D	0	0	347	0	0	0	0	62	0	162	0	521	35	1,128
Finished Products Warehouse (4A Warehouse)	77	0	110	135	0	0	0	0	352	0	393	0	205	88	1,284
Plant 6 Warehouse	79	0	134	96	0	0	0	0	364	0	272	0	171	64	1,101
Receiving/Incoming Materials Inspection	82	0	559	96	0	2,400	0	0	619	8	75	14	122	63	3,956
East Warehouses Complex Total		0	802	674	0	2,400	0	0	1,397	8	903	14	1,020	251	7,469
Plant 3 Complex															
Ozone Building	3 B	0	25	179	119	0	0	0	24	1	10	0	31	36	425
NAR Control House	3 C	0	125	1,542	407	0	0	0	7,857	0	125	0	71	89	10,217
NAR Towers	3 D	0	20	637	18	0	0	0	40,875	0	1,364	0	380	331	43,626
Hot Raffinate Building	3 E	0	340	645	543	5,940	0	0	24,830	39	349	11	195	229	33,121
Harshaw Digestion Fume Recovery	3 F	0	0	195	0	0	0	0	1,070	0	71	1	122	55	1,514
Refrigeration Building	3 G	0	15	531	130	0	0	1	989	1	12	0	21	30	1,730
Combined Raffinate Tanks	3 J	0	20	454	0	0	0	0	16,308	0	188	0	100	138	17,208
Old Cooling Water Tower	3 K	0	0	195	0	78	0	0	36	0	0	0	0	37	347
Incinerator Building	39 A	87	217	827	482	0	0	0	180	17	151	0	186	94	2,239
Incinerator Sprinkler Riser House	39 C	0	11	84	0	241	0	0	315	0	2	0	2	17	672
Plant 3 Complex Total		87	773	5,289	1,699	6,259	0	1	92,483	58	2,271	12	1,109	1,057	111,098
Plant 2 Complex															
Ore Refinery Plant	2 A	5	3,411	8,426	4,057	8,889	400	11	152,280	138	1,241	209	3,718	813	183,597
Metal Dissolver Building	2 D	0	332	1,550	347	0	0	0	9,501	12	108	1	134	142	12,127
NFS Storage and Pump House	2 E	0	32	231	0	518	0	0	6,943	0	281	0	3	120	8,128
Cold Side Ore Conveyor	2 F	0	28	199	91	0	0	0	6,144	0	7	1	44	42	6,557
Hot Side Ore Conveyor	2 G	0	19	167	62	0	0	0	7,991	0	39	0	39	41	8,357
Waste Oil Decant Shelter	39 B	0	0	64	0	0	0	0	17	0	4	0	24	14	124
Plant 2 Complex Total		5	3,821	10,637	4,557	9,407	400	11	182,876	150	1,680	211	3,963	1,172	218,890
Plant 8 Complex															
Recovery Plant	8 A	0	5,436	11,645	3,409	7,104	0	4	64,867	531	4,782	104	2,349	1,409	101,639
Plant 8 Maintenance Building	8 B	0	663	279	0	2,450	0	0	60	2	22	0	34	60	3,571
Rotary Kiln/Drum Reconditioning	8 C	0	1,992	4,939	0	3,800	0	0	38,240	3	28	33	1,557	132	50,724
Plant 8 Railroad Filter Building	8 D	0	4	48	0	0	0	0	22	2	22	0	4	13	115
Drum Conveyor Shelter	8 E	0	0	48	0	0	0	0	32	0	0	0	24	9	113
Plant 8 Old Drum Washer	8 F	0	0	32	0	0	0	0	0	0	0	2	0	10	44
Plant 8 Warehouse	80	0	64	386	0	0	0	0	187	0	106	0	102	92	937
Plant 8 Complex Total		0	8,158	17,376	3,409	13,354	0	4	103,408	539	4,961	139	4,070	1,725	157,142
General Sump Complex															
General/Refinery Sump Control Building	2 B	0	173	1,166	172	177	0	0	7,141	1	10	0	113	77	9,030
Bulk Lime Handling Building	2 C	0	115	139	91	0	0	0	2,237	12	104	0	31	41	2,770
Maintenance Building	3 A	0	152	1,638	440	0	0	0	9,671	6	53	0	98	84	12,139
Refinery Sump	3 H	0	20	370	0	0	0	0	12,851	0	235	0	65	136	13,677
Electrical Power Center Building	3 L	0	88	1,142	277	0	0	0	6,023	0	3	0	51	69	7,654
General Sump	18 B	0	120	613	0	0	0	0	1,390	0	466	2	65	230	2,886
Biodenitrification Towers	18 D	0	982	3,276	0	0	0	0	6,265	27	242	5	557	192	11,545
BDN Effluent Treatment Facility	18 H	0	73	708	0	0	0	0	37,959	4	34	0	9	68	38,855
General Sump Complex Total		0	1,724	9,052	980	177	0	0	83,538	50	1,147	7	986	896	98,555

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TABLE B–1 Operable Unit 3 Unbulked Material Volume Estimates (in cubic feet)

Component	Component Designation	OU3 RD/RA Material Category A Non–Reg., Non–Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non–Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Building 4A															
Green Salt Plant	4 A	344	3,276	8,986	4,673	0	0	13	88,945	209	1,879	133	5,844	866	115,168
External Complex															
Skeet Range Building	28 F	0	13	0	0	0	0	0	11	0	0	0	0	0	24
Sewage Treatment Plant Incinerator	39 D	149	0	112	39	203	0	0	633	0	10	0	10	23	1,179
Decontamination Building	69	0	589	972	0	5,625	0	0	136	26	236	0	156	116	7,855
External Complex Total		*149*	*602*	*1,083*	*39*	*5,828*	*0*	*0*	*779*	*26*	*246*	*0*	*165*	*139*	*9,058*
Thorium/Plant 9 Complex															
Special Products Plant	9 A	0	2,426	11,270	3,600	233	0	3	69,607	93	841	366	2,010	1,011	91,460
Plant 9 Sump Treatment Facility	9 B	0	78	454	161	81	0	0	797	14	128	1	33	46	1,794
Plant 9 Dust Collector	9 C	0	0	32	0	0	0	0	25	0	21	3	6	14	102
Plant 9 Substation	9 D	0	22	693	221	0	0	0	97	0	0	0	18	10	1,060
Plant 9 Cylinder Shed	9 E	0	0	16	6	0	0	0	0	0	0	0	1	3	26
Electrostatic Precipitator	9 F	0	5	46	12	0	0	0	47	2	19	0	4	15	152
Magnesium Storage Building	32 A	0	804	1,072	0	5,023	0	0	145	0	81	2	99	40	7,267
Building 32 Covered Loading Dock	32 B	0	93	201	0	0	0	0	19	0	0	0	17	3	332
Thorium Warehouse	64	0	1,549	275	12	1,200	0	3	986	0	218	0	197	74	4,514
(Old) Plant 5 Warehouse	65	0	916	92	0	0	0	2	247	0	245	0	269	54	1,824
D & D Building	76	0	1,957	3,159	0	8,160	0	0	4,478	21	189	0	239	88	18,291
Plant 9 Warehouse	81	0	64	120	0	0	0	0	199	0	154	0	81	49	665
Thorium/Plant 9 Complex Total		0	7,913	17,432	4,012	14,698	0	8	76,645	131	1,894	373	2,975	1,406	127,486
Boiler Plant/Water Plant Complex															
Boiler Plant	10 A	3,200	2,677	478	1,381	5,480	0	2	60,756	102	914	13	1,800	378	77,180
Boiler Plant Maintenance Building	10 B	0	139	72	6	580	0	0	148	2	14	0	41	21	1,023
Wet Salt Storage Bin	10 C	0	0	123	0	1,598	0	0	17	0	4	0	7	25	1,775
Utilities Heavy Equipment Building	10 E	0	70	373	0	0	0	0	56	1	5	0	12	10	526
Pump Station & Power Center	20 A	0	163	646	202	0	0	0	76	58	520	0	56	87	1,809
Water Plant	20 B	0	522	1,153	165	328	0	0	3,791	174	1,564	3	224	265	8,188
Cooling Towers	20 C	0	4,840	131	434	0	0	0	177,199	0	468	0	23	85	183,181
Process Water Storage Tank	20 H	0	0	928	0	8,100	0	0	0	0	47	0	0	182	9,257
Railroad Scale House	24 A	0	54	16	0	360	0	0	0	0	0	0	0	3	433
Coal Pile[1]	P–005														
Boiler Plant/Water Plant Complex Total		3,200	8,465	3,922	2,188	16,446	0	2	242,044	336	3,536	16	2,163	1,054	283,371
Tank Farm Complex															
Main Tank Farm	19 A	0	40	327	0	2,430	0	0	20,936	0	265	0	221	140	24,358
Tank Farm Control House	19 C	0	139	455	0	1,300	0	0	334	0	0	0	12	14	2,254
Old North Tank Farm	19 D	0	0	311	0	486	0	0	12,000	0	0	0	0	59	12,856
Tank Farm Lime Slitter Building	19 E	0	27	104	0	0	0	0	619	1	5	0	28	22	805
Tank Farm Complex Total		0	207	1,196	0	4,216	0	0	33,889	1	270	0	261	234	40,273
Plant 1 Complex															
Preparation Plant	1 A	5	1,038	9,184	2,667	5,019	0	1	42,155	228	2,050	317	1,647	1,290	65,600
Plant 1 Storage Shelter	1 B	0	125	211	0	0	0	0	101	0	0	0	124	40	602
Chemical Warehouse	30 A	0	1,501	1,986	1,746	320	0	1	501	0	437	0	620	167	7,279
Drum Storage Warehouse	30 B	0	73	104	0	0	0	0	31	0	5	0	8	21	242
CP Storage Warehouse	56 A	0	743	255	6	0	0	0	178	0	116	0	134	71	1,503
Storage Shed (West)	56 B	0	157	163	0	0	0	0	4	0	0	0	0	31	355
Storage Shed (East)	56 C	0	217	123	0	0	0	0	6	0	0	0	0	24	370
Quonset Hut #1	60	0	68	48	0	0	0	0	103	0	0	0	46	9	274
Quonset Hut #2	61	0	76	60	0	0	0	0	54	0	0	0	25	11	226
Quonset Hut #3	62	333	76	32	0	0	0	0	55	0	0	0	25	6	527
KC–2 Warehouse	63	50	2,524	4,801	0	9,146	0	0	464	0	320	0	371	106	17,782
Drum Reconditioning Building	66	0	195	490	9	0	0	0	5,761	25	221	6	51	127	6,884
Plant 1 Thorium Warehouse	67	0	215	271	0	0	0	0	105	0	0	0	117	52	760
General In–Process Warehouse	71	0	2,237	4,443	0	5,376	0	0	360	0	95	0	231	104	12,845
Drum Storage Building	72	0	54	247	113	0	0	0	39	0	4	0	51	48	556
Tension Support Structure #4	TS–004	0	304	175	0	0	0	0	620	0	0	0	408	33	1,541
Tension Support Structure #5	TS–005	0	336	175	0	0	0	0	620	0	0	0	408	33	1,574
Tension Support Structure #6	TS–006	0	94	56	0	0	0	0	54	0	0	0	45	11	259
Plant 1 Complex Total		389	10,032	22,824	4,542	19,860	0	3	51,211	252	3,248	323	4,312	2,184	119,179

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restriction, in this case, is the weight capacity of the top-loading containers, the number of containers for process piping is calculated based on the weight.

APPENDIX B
INTERIM REMEDIAL ACTION MATERIAL QUANTITY ESTIMATES

This appendix provides summary information concerning unbulked and bulked volume estimates, their associated weights, and container requirements for materials to be generated from the dismantlement of OU3 components. Estimates for the OU3 RD/RA material categories, as described in Section A.2.1, are provided for each component and are summed to provide complex totals. The complexes are listed in the same order as the sequence for the base schedule.

Category E (residues, hold-up materials, and sludges) has not been included in the tables since hold-up materials will be removed under Safe Shutdown and are discussed in Section A.2.3. Also, as treatment has not yet been defined by the OU3 RI/FS Report, sludges resulting from treatment cannot be estimated. Category M (furnaces and dissociators) and Category O (salvageable equipment) are currently included under Category I (restricted use metals) and Category N (unrestricted use metals). As salvageable equipment is sold or reused, their associated volumes will be deleted from Categories I and N.

Table B-1 lists unbulked volumes of materials for each component and complex. These volume estimates have been taken from the FEMP Sitewide Waste Information, Forecasting, and Tracking System (SWIFTS) database, which is the official FEMP database for material estimates and is constantly being updated with improved, more detailed volume estimates.

Table B-2 provides bulked volume estimates for OU3 materials. These numbers were calculated by multiplying the media-specific bulking factors, as listed in Table A.3-1, with the unbulked volume estimates provided in Table B-1. As discussed in Section A.3, these bulking factors originated during the development of the OU3 PP/EA and have been further refined from data gathered from Removal No. 19 (Plant 7 Dismantling) and from construction industry standards.

The estimates of material tonnage in Table B-3 are calculated by multiplying unbulked material densities to unbulked volume estimates provided in Table B-1. These material densities are either generally well-known chemical properties (e.g., the density of steel is 490 pounds per cubic foot) or were provided by the manufacturer of the material (e.g., the density of transite is 112 pounds per cubic foot).

Table B-4 provides estimates of the number and types of containers that will be necessary to containerize and transport the generated material. Preliminary assumptions of the container type, which have been used in Table B-4, are based on the development of the OU3 RI/FS Report and are subject to change.

Every container has a volume limit, based on the interior size of the container, and a weight limit, based on transportation restrictions and the strength of the container. Therefore, based on the densities, Table B-4 lists the limit which the material will meet first for its associated container. The number of containers are then calculated based on that restriction. For example, Category J materials (process piping) will be placed in top-loading containers which have a 971 cubic feet capacity and an 18 ton weight restriction. The estimated bulked volume (Table B-2) and weight (Table B-3) of all above-grade and below-grade process piping are 35,536 cubic feet and 985 tons. This volume would fill 36.6 top-loading containers if weight were not a restriction; this weight would allow for 54.7 containers. Since the limiting

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APPENDIX B

INTERIM REMEDIAL ACTION MATERIAL QUANTITY ESTIMATES

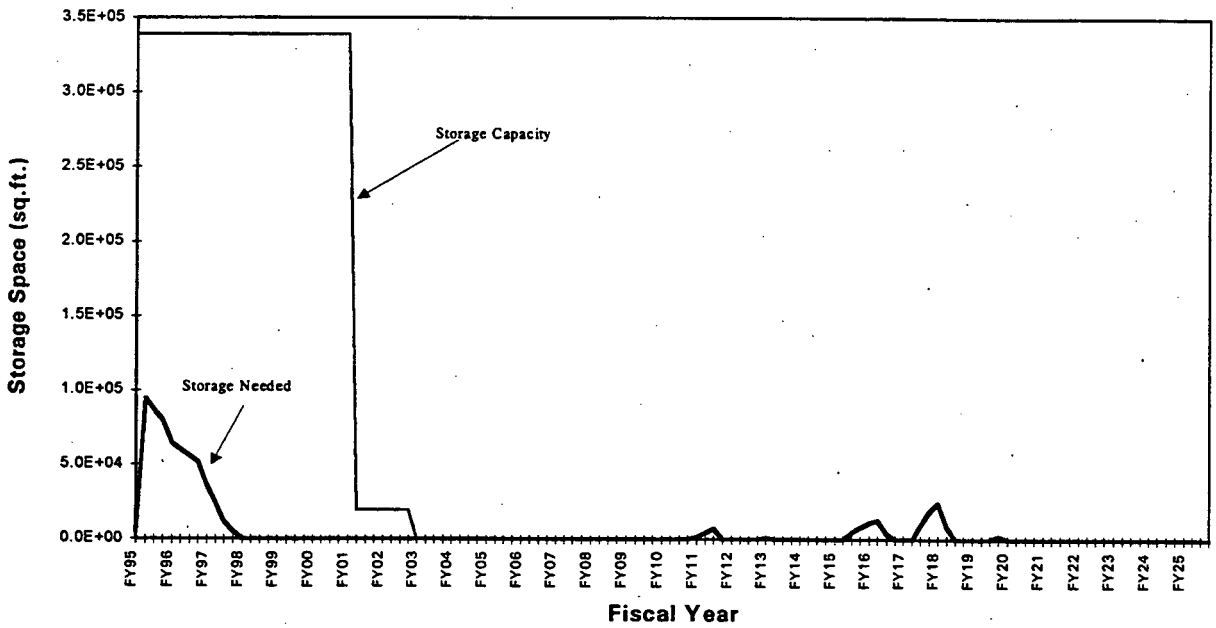

FIGURE A.6-3 Material Balance for Uncovered Material Storage

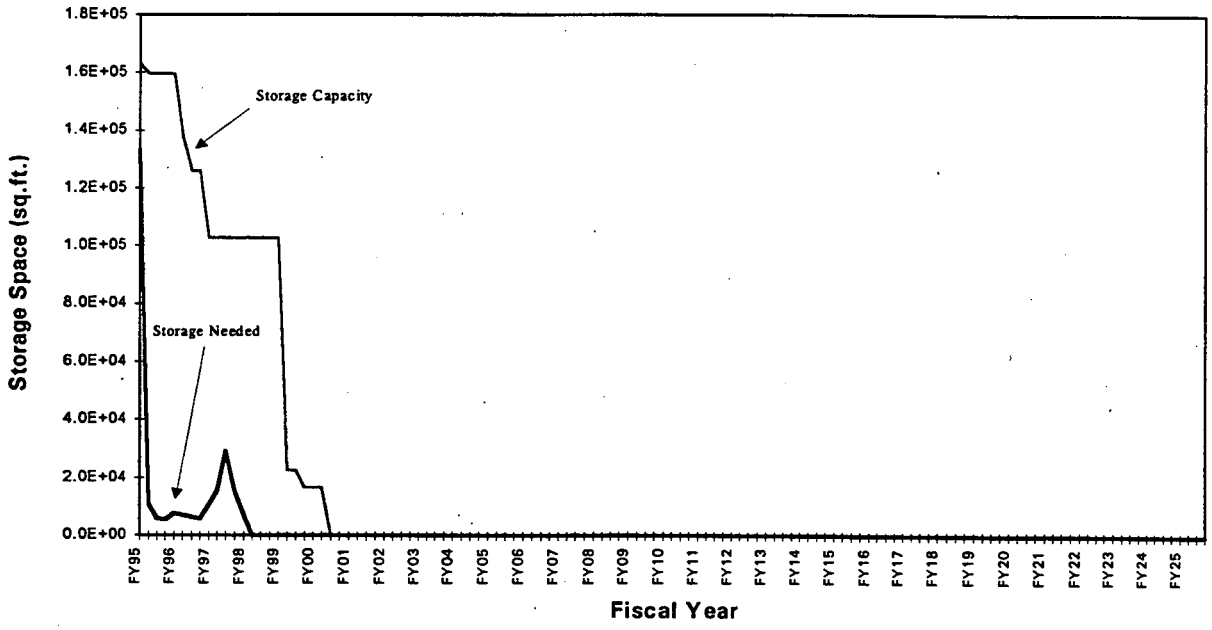

FIGURE A.6-2 Material Balance Summary for Non-RCRA Covered Material Storage

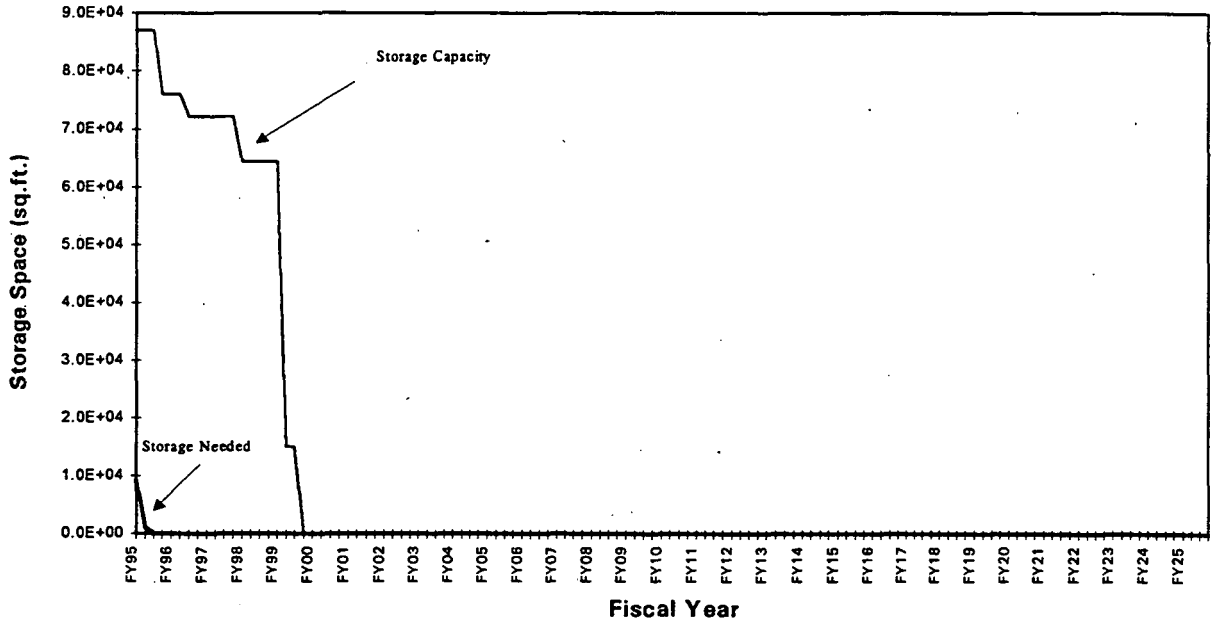

FIGURE A.6-1 Material Balance Summary for Hazardous and Mixed Waste Storage

A.6 Material Balance Summary

This section presents the results of the material balance analysis in the form of three graphs which compare material accumulation to maximum capacity for hazardous and mixed waste (RCRA) storage (Figure A.6-1), covered (non-RCRA) storage (Figure A.6-2), and uncovered storage (Figure A.6-3).

The conclusion that is apparent from each of these graphs is that the maximum capacity for temporary storage of material for each of these three types of storage facilities, for the most part, exceeds the projected need for storage. The one exception is that Figure A.6-3 illustrates that uncovered storage capacity will be eliminated in the late FY-03 but that there will still be a need for a limited amount of uncovered storage occasionally between FY-11 and FY-20. The implications of these material balance results on the base schedule have been discussed in Section 6.0 of the PSR.

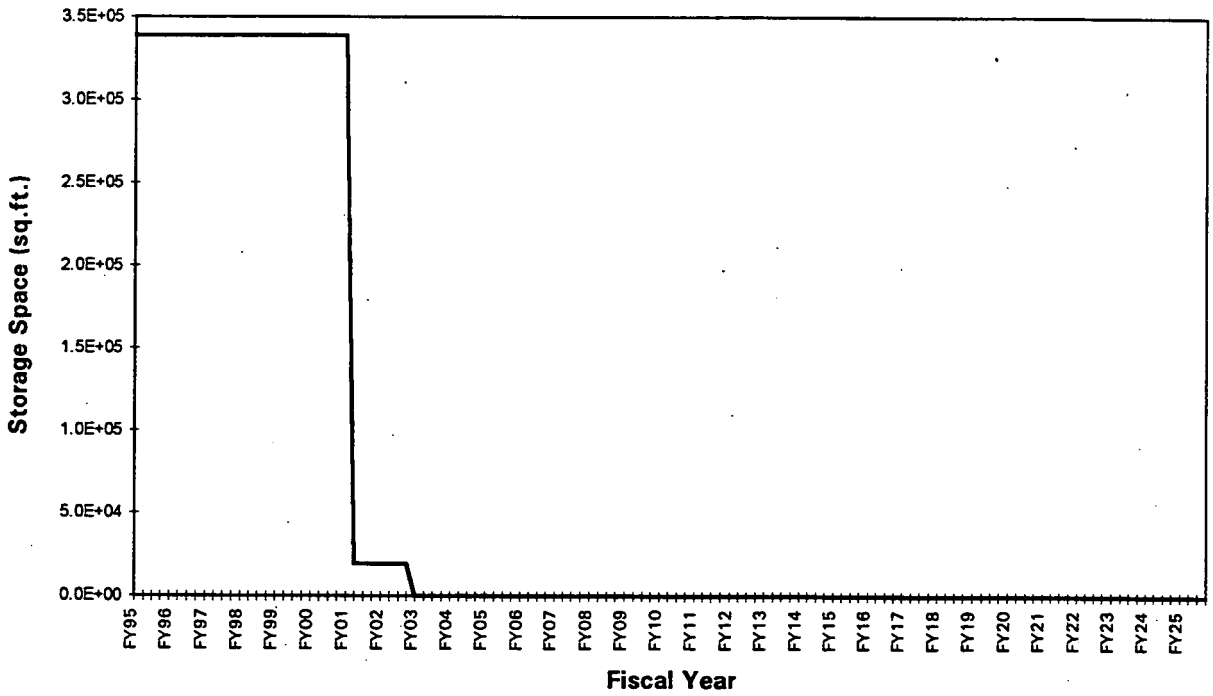

FIGURE A.5-4 Maximum On-Property Storage Capacities for Uncovered Storage

A.5.3 Uncovered Storage

The uncovered storage facilities are storage pads that are used to store LLW and/or Nuclear Material. There are currently six uncovered storage pads on-property. These pads are located on either asphalt or concrete. Table A.5-3 lists the uncovered storage facilities and their maximum storage capacities. Figure A.5-4 graphically represents the current maximum on-property uncovered storage capacity for LLW and nuclear products at any given time over the course of the OU3 interim remedial action.

TABLE A.5-3 Maximum Capacities of Uncovered Storage Facilities

Storage Facility	Component Number	Maximum Storage Capacity (ft^2)
Plant 8 East Pad	74C	12,100
Plant 8 West Pad	74D	7,200
Plant 9 Pad	74K	7,900
Building 65 West Pad	74L	19,900
Building 64 East Pad	74M	22,500
Plant 1 Pad (minus TSS areas)	74T	268,900
Total Uncovered Storage Capacity		338,500

TABLE B-3 Operable Unit 3 Material Weight Estimates (in tons)

Component	Component Designation	OU3 RD/RA Material Category A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Building 4A															
Green Salt Plant	4 A	98.6	63.4	20.2	261.6	0.0	0.0	3.8	1,292.4	11.6	104.2	4.6	1,431.7	1.9	3,294
External Complex															
Skeet Range Building	28 F	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0
Sewage Treatment Plant Incinerator	39 D	42.8	0.0	0.3	2.2	13.6	0.0	0.0	9.2	0.0	0.6	0.0	2.4	0.1	71
Decontamination Building	69	0.0	11.4	2.2	0.0	378.0	0.0	0.0	2.0	1.5	13.1	0.0	38.1	0.3	446
External Complex Total		42.8	11.6	2.4	2.2	391.6	0.0	0.0	11.3	1.5	13.6	0.0	40.5	0.3	518
Thorium/Plant 9 Complex															
Special Products Plant	9 A	0.0	46.9	25.4	201.5	15.7	0.0	0.8	1,011.4	5.2	46.6	12.6	492.5	2.3	1,861
Plant 9 Sump Treatment Facility	9 B	0.0	1.5	1.0	9.0	5.4	0.0	0.0	11.6	0.8	7.1	0.0	8.2	0.1	45
Plant 9 Dust Collector	9 C	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	1.2	0.1	1.5	0.0	3
Plant 9 Substation	9 D	0.0	0.4	1.6	12.3	0.0	0.0	0.0	1.4	0.0	0.0	0.0	4.3	0.0	20
Plant 9 Cylinder Shed	9 E	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1
Electrostatic Precipitator	9 F	0.0	0.1	0.1	0.7	0.0	0.0	0.0	0.7	0.1	1.0	0.0	1.0	0.0	4
Magnesium Storage Building	32 A	0.0	15.5	2.4	0.0	337.6	0.0	0.0	2.1	0.0	4.5	0.1	24.3	0.1	387
Building 32 Covered Loading Dock	32 B	0.0	1.6	0.5	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	4.2	0.0	7
Thorium Warehouse	64	0.0	30.0	0.6	0.7	80.6	0.0	0.8	14.3	0.0	12.1	0.0	48.4	0.2	188
(Old) Plant 5 Warehouse	65	0.0	17.7	0.2	0.0	0.0	0.0	0.5	3.6	0.0	13.6	0.0	66.0	0.1	102
D & D Building	78	0.0	37.9	7.1	0.0	548.3	0.0	0.0	65.1	1.2	10.5	0.0	58.5	0.2	729
Plant 9 Warehouse	81	0.0	1.2	0.3	0.0	0.0	0.0	0.0	2.9	0.0	8.5	0.0	19.8	0.1	33
Thorium/Plant 9 Complex Total		0.0	153.1	39.2	224.5	987.7	0.0	2.2	1,113.7	7.2	105.0	12.8	728.8	3.2	3,377
Boiler Plant/Water Plant Complex															
Boiler Plant	10 A	918.1	51.8	1.1	77.3	368.3	0.0	0.6	882.8	5.6	50.7	0.4	441.0	0.8	2,798
Boiler Plant Maintenance Building	10 B	0.0	2.7	0.2	0.3	39.0	0.0	0.0	2.2	0.1	0.8	0.0	10.1	0.0	55
Wet Salt Storage Bin	10 C	0.0	0.0	0.3	0.0	107.4	0.0	0.0	0.2	0.0	0.2	0.0	1.8	0.1	110
Utilities Heavy Equipment Building	10 E	0.0	1.3	0.8	0.0	0.0	0.0	0.0	0.8	0.0	0.3	0.0	3.0	0.0	6
Pump Station & Power Center	20 A	0.0	3.2	1.5	11.3	0.0	0.0	0.0	1.1	3.2	28.9	0.0	13.6	0.2	63
Water Plant	20 B	0.0	10.1	2.6	9.2	22.0	0.0	0.0	55.1	9.6	86.7	0.1	54.8	0.6	251
Cooling Towers	20 C	0.0	93.6	0.3	24.3	0.0	0.0	0.0	2,574.7	0.0	26.0	0.0	5.6	0.2	2,725
Process Water Storage Tank	20 H	0.0	0.0	2.1	0.0	544.3	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.4	549
Railroad Scale House	24 A	0.0	1.0	0.0	0.0	24.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25
Coal Pile[1]	P-005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Boiler Plant/Water Plant Complex Total		918.1	163.8	8.8	122.4	1,105.2	0.0	0.7	3,516.9	18.6	196.1	0.6	529.9	2.4	6,583
Tank Farm Complex															
Main Tank Farm	19 A	0.0	0.8	0.7	0.0	163.3	0.0	0.0	304.2	0.0	14.7	0.0	54.2	0.3	538
Tank Farm Control House	19 C	0.0	2.7	1.0	0.0	87.4	0.0	0.0	4.9	0.0	0.0	0.0	3.0	0.0	99
Old North Tank Farm	19 D	0.0	0.0	0.7	0.0	32.7	0.0	0.0	174.4	0.0	0.0	0.0	0.0	0.1	208
Tank Farm Lime Slitter Building	19 E	0.0	0.5	0.2	0.0	0.0	0.0	0.0	9.0	0.0	0.3	0.0	6.8	0.0	17
Tank Farm Complex Total		0.0	4.0	2.7	0.0	283.3	0.0	0.0	492.4	0.0	15.0	0.0	64.0	0.5	862
Plant 1 Complex															
Preparation Plant	1 A	1.6	20.1	20.7	149.3	337.3	0.0	0.4	612.5	12.6	113.7	10.9	403.4	2.9	1,685
Plant 1 Storage Shelter	1 B	0.0	2.4	0.5	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	30.5	0.1	35
Chemical Warehouse	30 A	0.0	29.0	4.5	97.7	21.5	0.0	0.4	7.3	0.0	24.2	0.0	152.0	0.4	337
Drum Storage Warehouse	30 B	0.0	1.4	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.0	2.0	0.0	4
CP Storage Warehouse	56 A	0.0	14.4	0.6	0.3	0.0	0.0	0.0	2.6	0.0	6.4	0.0	32.8	0.2	57
Storage Shed (West)	56 B	0.0	3.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	4
Storage Shed (East)	56 C	0.0	4.2	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	5
Quonset Hut #1	60	0.0	1.3	0.1	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	11.3	0.0	14
Quonset Hut #2	61	0.0	1.5	0.1	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	6.0	0.0	8
Quonset Hut #3	62	95.6	1.5	0.1	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	6.0	0.0	104
KC-2 Warehouse	63	14.3	48.8	10.8	0.0	614.6	0.0	0.0	6.7	0.0	17.8	0.0	90.9	0.2	804
Drum Reconditioning Building	66	0.0	3.8	1.1	0.5	0.0	0.0	0.0	83.7	1.4	12.3	0.2	12.5	0.3	116
Plant 1 Thorium Warehouse	67	0.0	4.2	0.6	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	28.7	0.1	35
General In-Process Warehouse	71	0.0	43.3	10.0	0.0	361.3	0.0	0.0	5.2	0.0	5.3	0.0	56.6	0.2	482
Drum Storage Building	72	0.0	1.0	0.6	6.3	0.0	0.0	0.0	0.6	0.0	0.2	0.0	12.5	0.1	21
Tension Support Structure #4	TS-004	0.0	5.9	0.4	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	100.0	0.1	115
Tension Support Structure #5	TS-005	0.0	6.5	0.4	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	100.0	0.1	116
Tension Support Structure #6	TS-006	0.0	1.8	0.1	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	11.0	0.0	14
Plant 1 Complex Total		111.5	194.1	51.4	254.2	1,334.6	0.0	0.8	744.1	14.0	180.1	11.1	1,056.3	4.9	3,957

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TABLE B–3 Operable Unit 3 Material Weight Estimates (in tons)

Component	Component Designation	OU3 RD/RA Material Category													Component/ Complex Totals
		A Non–Reg., Non–Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non–Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	
Maintenance Complex															
Main Maintenance Building	12 A	25.8	88.4	35.6	259.1	1,784.4	0.0	0.0	130.1	1.1	10.1	1.7	356.2	0.7	2,693
Cylinder Storage Building	12 B	0.0	2.8	0.9	0.0	104.6	0.0	0.0	1.8	0.0	0.0	0.0	3.2	0.1	113
Lumber Storage Building	12 C	0.0	2.2	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	6.0	0.0	9
Maintenance Building Warehouse	12 D	0.0	1.9	3.6	0.0	0.0	0.0	0.0	2.0	0.0	5.8	0.0	13.1	0.1	26
Railroad Engine House	24 B	0.0	3.2	0.8	0.0	116.5	0.0	0.0	1.4	0.1	0.6	0.0	3.0	0.1	126
Propane Storage	38 A	0.0	1.8	0.5	0.0	95.5	0.0	0.0	1.1	2.0	17.8	0.0	2.6	0.2	122
Cylinder Filling Station	38 B	0.0	0.1	0.6	0.0	0.0	0.0	0.0	29.1	0.0	0.6	0.0	0.4	0.1	31
Maintenance Complex Total		25.8	100.4	42.1	259.1	2,100.9	0.0	0.0	166.1	3.2	34.9	1.7	384.5	1.3	3,120
East Warehouses Complex															
Elevated Potable Storage Tank	20 D	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.9	0.0	9.0	0.0	127.6	0.1	138
Finished Products Warehouse (4A Warehouse)	77	0.0	2.1	0.3	0.0	0.0	0.0	0.0	5.1	0.0	21.8	0.0	50.3	0.2	80
Plant 6 Warehouse	79	0.0	2.6	0.2	0.0	0.0	0.0	0.0	5.3	0.0	15.1	0.0	41.9	0.1	65
Receiving/Incoming Materials Inspection	82	0.0	10.8	0.2	0.0	161.3	0.0	0.0	9.0	0.5	4.2	0.5	30.0	0.1	217
East Warehouses Complex Total		0.0	15.5	1.5	0.0	161.3	0.0	0.0	20.3	0.5	50.1	0.5	249.8	0.6	500
Plant 3 Complex															
Ozone Building	3 B	0.0	0.5	0.4	6.7	0.0	0.0	0.0	0.4	0.1	0.5	0.0	7.5	0.1	16
NAR Control House	3 C	0.0	2.4	3.5	22.8	0.0	0.0	0.0	114.2	0.0	6.9	0.0	17.5	0.2	167
NAR Towers	3 D	0.0	0.4	1.4	1.0	0.0	0.0	0.0	593.9	0.0	75.6	0.0	93.2	0.7	766
Hot Raffinate Building	3 E	0.0	6.6	1.5	30.4	399.2	0.0	0.0	360.8	2.1	19.3	0.4	47.8	0.5	869
Harshaw Digestion Fume Recovery	3 F	0.0	0.0	0.4	0.0	0.0	0.0	0.0	15.5	0.0	3.9	0.0	30.0	0.1	50
Refrigeration Building	3 G	0.0	0.3	1.2	7.3	0.0	0.0	0.2	14.4	0.1	0.7	0.0	5.1	0.1	29
Combined Raffinate Tanks	3 J	0.0	0.4	1.0	0.0	0.0	0.0	0.0	237.0	0.0	10.4	0.0	24.6	0.3	274
Old Cooling Water Tower	3 K	0.0	0.0	0.4	0.0	5.2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	6
Incinerator Building	39 A	24.9	4.2	1.9	27.0	0.0	0.0	0.0	2.6	0.9	8.4	0.0	45.6	0.2	116
Incinerator Sprinkler Riser House	39 C	0.0	0.2	0.2	0.0	16.2	0.0	0.0	4.6	0.0	0.1	0.0	0.6	0.0	22
Plant 3 Complex Total		24.9	15.0	11.9	95.1	420.6	0.0	0.2	1,343.8	3.2	125.9	0.4	271.8	2.4	2,315
Plant 2 Complex															
Ore Refinery Plant	2 A	1.3	66.0	19.0	227.0	597.3	28.0	3.3	2,212.6	7.6	68.8	7.2	910.9	1.8	4,151
Metal Dissolver Building	2 D	0.0	6.4	3.5	19.4	0.0	0.0	0.0	138.1	0.7	6.0	0.0	32.8	0.3	207
NFS Storage and Pump House	2 E	0.0	0.6	0.5	0.0	34.8	0.0	0.0	100.9	0.0	15.6	0.0	0.7	0.3	153
Cold Side Ore Conveyor	2 F	0.0	0.5	0.4	5.1	0.0	0.0	0.0	89.3	0.0	0.4	0.0	10.9	0.1	107
Hot Side Ore Conveyor	2 G	0.0	0.4	0.4	3.4	0.0	0.0	0.0	116.1	0.0	2.1	0.0	9.6	0.1	132
Waste Oil Decant Shelter	39 B	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	6.0	0.0	7
Plant 2 Complex Total		1.3	73.9	23.9	255.0	632.2	28.0	3.3	2,657.2	8.3	93.1	7.3	971.0	2.6	4,757
Plant 8 Complex															
Recovery Plant	8 A	0.0	105.2	26.2	190.8	477.4	0.0	1.1	942.5	29.5	265.2	3.6	575.4	3.2	2,620
Plant 8 Maintenance Building	8 B	0.0	12.8	0.6	0.0	164.6	0.0	0.0	0.9	0.1	1.2	0.0	8.3	0.1	189
Rotary Kiln/Drum Reconditioning	8 C	0.0	38.5	11.1	0.0	255.4	0.0	0.0	555.6	0.2	1.5	1.1	381.6	0.3	1,245
Plant 8 Railroad Filter Building	8 D	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.1	1.2	0.0	1.0	0.0	3
Drum Conveyor Shelter	8 E	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	5.8	0.0	6
Plant 8 Old Drum Washer	8 F	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0
Plant 8 Warehouse	80	0.0	1.2	0.9	0.0	0.0	0.0	0.0	2.7	0.0	5.9	0.0	25.0	0.2	36
Plant 8 Complex Total		0.0	157.8	39.1	190.8	897.4	0.0	1.1	1,502.5	29.9	275.1	4.8	997.1	3.9	4,099
General Sump Complex															
General/Refinery Sump Control Building	2 B	0.0	3.4	2.6	9.6	11.9	0.0	0.1	103.8	0.1	0.6	0.0	27.7	0.2	160
Bulk Lime Handling Building	2 C	0.0	2.2	0.3	5.1	0.0	0.0	0.0	32.5	0.6	5.8	0.0	7.5	0.1	54
Maintenance Building	3 A	0.0	2.9	3.7	24.6	0.0	0.0	0.0	140.5	0.3	2.9	0.0	23.4	0.2	199
Refinery Sump	3 H	0.0	0.4	0.8	0.0	0.0	0.0	0.0	186.7	0.0	13.0	0.0	15.9	0.3	217
Electrical Power Center Building	3 L	0.0	1.7	2.6	15.5	0.0	0.0	0.0	87.5	0.0	0.2	0.0	12.5	0.2	120
General Sump	18 B	0.0	2.3	1.4	0.0	0.0	0.0	0.0	20.2	0.0	25.8	0.1	15.9	0.5	66
Biodenitrification Towers	18 D	0.0	19.0	7.4	0.0	0.0	0.0	0.0	91.0	1.5	13.4	0.2	136.5	0.4	269
BDN Effluent Treatment Facility	18 H	0.0	1.4	1.6	0.0	0.0	0.0	0.0	551.5	0.2	1.9	0.0	2.2	0.2	559
General Sump Complex Total		0.0	33.3	20.4	54.8	11.9	0.0	0.1	1,213.8	2.7	63.6	0.2	241.5	2.0	1,644

TABLE B–3 Operable Unit 3 Material Weight Estimates (in tons)

Component	Component Designation	OU3 RD/RA Material Category A Non–Reg., Non–Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non–Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Plant 5 Complex															
Plant 4 Warehouse	4 B	0.0	3.7	0.7	0.0	0.0	0.0	0.0	4.4	0.0	8.7	0.0	40.6	0.2	58
Metals Production Plant	5 A	387.9	91.7	28.3	298.9	1,293.1	0.0	0.9	2,765.5	15.6	140.7	15.6	1,246.5	3.7	6,288
Plant 5 Ingot Pickling	5 B	0.0	1.0	0.5	0.0	0.0	0.0	0.0	40.3	0.3	3.0	0.0	14.4	0.1	60
Plant 5 Electrical Substation	5 C	0.0	0.9	0.3	0.0	0.0	0.0	0.0	10.7	0.5	4.3	0.0	2.0	0.1	19
West Derby Breakout/ Slag Milling	5 D	0.0	2.3	1.7	0.0	15.0	0.0	0.0	353.8	2.0	17.6	0.3	380.6	0.6	774
Plant 5 Filter Building	5 E	0.0	3.3	0.3	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	9.3	0.1	14
Plant 5 Covered Storage Pad	5 F	0.0	2.8	0.3	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	35.1	0.1	42
Plant 5 Ingot Storage Shelter	5 G	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	6.2	0.0	7
Slag Recycling Building	55 A	0.0	10.4	3.8	28.0	0.0	0.0	0.0	98.2	0.0	0.4	0.5	76.0	0.3	218
Slag Recycling Pit/Elevator	55 B	0.0	0.1	0.3	5.6	0.0	0.0	0.0	7.4	0.1	1.0	0.2	13.7	0.1	28
Plant 5 Complex Total		387.9	116.6	36.5	332.6	1,308.1	0.0	0.9	3,285.1	18.6	175.7	16.6	1,824.3	5.3	7,508
Plant 6 Complex															
Metals Fabrication Plant	6 A	25.9	136.6	2.1	593.4	581.4	0.0	0.0	2,954.8	19.6	176.7	10.4	1,336.0	2.9	5,840
Plant 6 Covered Storage Area	6 B	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.2	10.8	0.1	12
Plant 6 Electrostatic Precipitator (South)	6 C	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.8	0.1	1.0	0.3	3.0	0.1	6
Plant 6 Electrostatic Precipitator (Central)	6 D	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.7	0.3	1.5	0.1	3
Plant 6 Electrostatic Precipitator (North)	6 E	0.0	0.0	0.3	0.0	0.0	0.0	0.0	8.9	0.1	1.0	0.3	3.0	0.1	14
Plant 6 Salt Oil Heat Treat Building	6 F	0.0	0.5	0.6	0.0	0.0	0.0	0.0	22.0	5.1	46.2	0.1	5.0	0.6	80
Plant 6 Sump Building	6 G	0.0	1.8	4.3	1.4	14.5	0.0	0.0	136.7	5.2	47.0	0.0	90.4	0.5	302
Plant 6 Complex Total		25.9	138.8	8.2	594.8	595.9	0.0	0.0	3,123.6	30.2	273.7	11.5	1,449.7	4.3	6,257
Liquid Storage Complex															
Methanol Tank	18 J	0.0	0.0	0.0	0.0	21.8	0.0	0.0	0.4	0.0	1.1	0.0	4.5	0.0	28
Low Nitrate Tank	18 K	0.0	1.2	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.4	0.0	2.0	0.0	9
High Nitrate Tank	18 L	0.0	1.2	0.1	0.0	0.0	0.0	0.0	5.7	0.0	0.4	0.0	2.0	0.0	9
Well House #1	20 E	0.0	1.1	0.2	0.0	20.1	0.0	0.0	0.7	0.1	0.8	0.0	0.0	0.0	23
Well House #2	20 F	0.0	1.1	0.2	0.0	20.2	0.0	0.0	0.9	0.1	0.8	0.0	0.0	0.0	23
Well House #3	20 G	0.0	1.8	0.2	0.0	26.6	0.0	0.0	5.4	0.0	0.0	0.0	0.4	0.0	34
Gas Meter Building	22 A	0.0	0.9	0.2	0.0	38.9	0.0	0.0	0.4	0.1	0.6	0.0	0.4	0.0	42
Storm Sewer Lift Station	22 B	0.0	0.1	0.2	0.0	17.1	0.0	0.0	3.6	0.2	1.4	0.1	0.6	0.1	23
Scale House & Weigh Scale	22 D	0.0	0.0	0.2	0.9	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.8	0.0	2
Pump House–HP Fire Protection	26 A	0.0	3.8	0.8	0.0	390.6	0.0	0.0	6.0	0.9	7.7	0.0	41.2	0.1	451
Elevated Water Storage Tank	26 B	0.0	0.0	0.3	0.0	36.3	0.0	0.0	1.8	0.0	19.7	0.0	432.0	0.1	490
Rust Engineering Building	45 A	0.0	17.1	0.8	0.0	203.3	0.0	0.0	29.4	0.0	11.6	1.7	41.4	0.4	306
Utility Shed East of Rust Trailers	45 B	0.0	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
Liquid Storage Complex Total		0.0	29.6	3.5	0.9	775.0	0.0	0.0	60.3	1.3	44.4	1.8	525.2	1.0	1,443
Pilot Plant Complex															
Pilot Plant Wet Side	13 A	0.0	38.5	4.8	21.0	700.8	0.0	0.2	243.5	9.3	83.6	0.4	41.6	1.0	1,145
Pilot Plant Maintenance Building	13 B	0.0	7.0	0.9	0.0	226.2	0.0	0.0	2.5	0.2	1.4	0.0	2.9	0.1	241
Sump Pump House	13 C	0.0	1.0	0.2	0.0	22.4	0.0	0.0	4.1	0.3	2.6	0.0	1.0	0.1	32
Pilot Plant Thorium Tank Farm	13 D	0.0	0.0	0.5	0.0	0.0	0.0	0.0	139.6	0.0	4.8	0.0	0.0	0.1	145
Pilot Plant Annex	37	0.0	12.7	2.8	0.0	416.6	0.0	0.0	165.3	1.7	14.9	0.0	35.4	0.2	650
Six to Four Reduction Facility #1	54 A	0.0	33.3	9.2	12.4	704.1	0.0	0.4	407.0	2.3	20.8	2.0	138.8	1.1	1,331
Pilot Plant Shelter	54 B	0.0	0.5	1.7	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	6.0	0.3	10
Pilot Plant Dissociator Shelter	54 C	0.0	0.3	0.0	0.0	0.0	0.0	0.0	23.8	0.5	4.1	0.0	6.0	0.0	35
Pilot Plant Warehouse	68	0.0	4.3	0.6	20.1	54.4	0.0	0.1	4.8	0.0	0.0	0.0	37.8	0.1	122
Pilot Plant Complex Total		0.0	97.7	20.6	53.6	2,124.6	0.0	0.7	991.8	14.2	132.2	2.4	269.4	3.1	3,710
Laboratory Complex															
Laboratory	15 A	0.0	355.0	31.6	2.3	5,699.6	0.0	0.0	439.4	27.4	247.0	18.5	218.7	5.0	7,045
Laboratory Chemical Storage Building	15 B	0.0	0.2	0.0	0.0	58.4	0.0	0.0	7.6	0.0	0.6	0.1	3.2	0.0	70
Laboratory Complex Total		0.0	355.3	31.6	2.3	5,757.9	0.0	0.0	447.1	27.4	247.6	18.6	222.0	5.0	7,115

TABLE B-3 Operable Unit 3 Material Weight Estimates (in tons)

Component	Component Designation	A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Electrical Station Complex															
Main Electrical Station	16 A	0.0	5.7	0.3	0.0	123.4	0.0	0.0	60.3	0.0	0.0	0.0	24.0	0.1	214
Electrical Substation	16 B	0.0	18.5	0.3	0.0	59.4	0.0	0.4	14.7	0.0	0.0	0.0	0.7	0.0	94
Electrical Panels & Transformer	16 C	0.0	1.7	0.3	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	2
Main Electrical Switch House	16 D	0.0	0.2	0.3	0.9	51.0	0.0	0.0	7.7	0.0	0.0	0.0	0.6	0.1	61
Main Electrical Transformers	16 E	0.0	190.2	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	191
Trailer Substation #1	16 F	0.0	1.1	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.7	0.0	4
Trailer Substation #2	16 G	0.0	1.1	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.6	0.0	4
Main Electrical Strainer House	26 C	0.0	0.2	0.3	0.3	17.9	0.0	0.0	0.6	0.1	0.8	0.0	0.3	0.1	20
Engine House/Garage	31 A	0.0	20.1	3.1	0.0	304.2	0.0	0.0	9.0	0.6	5.0	0.0	31.0	0.1	373
Heavy Equipment Building	46	0.0	14.8	0.4	0.0	69.9	0.0	0.0	5.0	0.7	6.4	0.0	53.9	0.1	151
Electrical Station Complex Total		0.0	253.6	5.2	1.2	625.7	0.0	0.4	102.3	1.4	12.2	0.0	111.8	0.5	1,114
Sewage Treatment Plant Complex															
Chlorination Building	25 A	0.0	1.3	0.1	0.0	31.0	0.0	0.0	1.3	0.0	0.1	0.0	0.0	0.0	34
M.H.#175/Effluent Line/Sampling Building	25 B	0.0	0.2	0.1	0.0	0.0	0.0	0.0	2.3	0.0	0.2	0.0	0.0	0.0	3
Sewage Lift Station Building	25 C	0.0	0.7	0.2	0.0	35.6	0.0	0.0	1.5	0.0	0.2	0.0	1.0	0.0	39
U.V. Disinfection Building	25 D	0.0	0.2	0.1	0.0	22.5	0.0	0.0	1.8	0.1	1.1	0.0	0.1	0.0	26
Digester & Control Building	25 E	0.0	1.7	0.4	0.0	257.2	0.0	0.0	4.7	0.5	4.4	0.0	7.4	0.1	276
Sewage Treatment Plant Complex Total		0.0	4.1	0.9	0.0	346.3	0.0	0.0	11.6	0.7	5.9	0.0	8.5	0.2	378
Administration Complex															
Service Building	11	215.3	140.4	27.9	0.0	9,942.3	0.0	0.1	366.0	0.0	197.3	7.7	40.1	2.2	10,939
Administration Building	14 A	54.0	182.8	6.9	0.0	2,879.9	0.0	0.0	139.4	0.0	23.0	1.3	13.3	0.4	3,301
Building 14 EOC Generator Set	14 B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	4
Security Building	28 A	0.0	38.2	4.4	0.0	549.6	0.0	0.0	10.3	0.0	0.4	0.6	2.5	0.1	606
Human Resources Building	28 B	0.0	58.0	3.3	0.0	214.9	0.0	0.0	12.9	0.0	1.1	1.0	57.6	0.1	349
Health & Safety Building	53 A	117.6	365.6	10.9	0.0	3,181.0	0.0	0.0	79.7	0.0	44.1	5.2	81.9	1.0	3,887
In-Vivo Building	53 B	0.0	14.5	2.6	0.0	0.0	0.0	0.0	18.5	0.0	1.8	0.3	6.0	0.1	44
Administration Complex Total		386.9	799.5	56.0	0.0	16,767.7	0.0	0.1	630.6	0.0	267.5	16.0	201.4	3.9	19,130
Miscellaneous Complex															
10-Plex North Substation	16 H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	12
10-Plex South Substation	16 J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	12
Clearwell Pump House	18 G	0.0	4.1	0.0	1.3	0.0	0.0	0.0	1.5	0.0	0.3	0.0	0.6	0.0	8
Meteorological Tower	23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.9	0.0	2
10-Plex Sewage Lift Station	25 J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1
Guard Post on West End of 2nd Street	28 D	0.0	1.9	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	2
Guard Post East of T-81	28 E	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	1
Guard Post South of Building 51	28 G	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	1
Utility Lines	G-004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.3	17.3	791.0	0.0	0.0	23.1	861
Process Trailers	G-006	0.0	1,376.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,376
Non-Process Trailers	G-007	0.0	5,903.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5,903
Pipe Bridges	G-008	0.0	0.0	0.0	0.0	23.6	0.0	0.0	0.0	0.0	0.0	0.0	554.2	0.0	578
Miscellaneous Complex Total		0.0	7,285.6	0.5	1.3	23.6	0.0	0.0	57.1	17.4	791.3	0.0	557.3	23.2	8,757
Below Grade Components		967.7	530.5	0.0	0.0	265,357.9	1,420.6	0.0	3.0	773.4	2,372.4	0.0	2,385.6	0.0	273,811
Operable Unit 3 Total		2,991	10,597	427	2,706	302,009	1,449	14	22,787	985	5,580	111	14,522	73	364,251

[1] The quantities of stockpiled coal vary seasonally. No significant quantities of coal are expected to remain after the Boiler Plant/Water Plant Complex is shut down.

TABLE B-4 Container Estimates for OU3 Materials

Component	Component Designation	A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Container Type:[1] Restricted by Weight or Volume:		R/O weight	R/O volume	R/O volume	R/O weight	R/O weight	WMB weight	R/O weight	T/L volume	T/L weight	R/O weight	R/O volume	R/O volume	R/O volume	
Building 4A															
Green Salt Plant	4 A	5.8	8.1	13.3	15.4	0.0	0.0	0.2	317.4	0.6	6.1	0.3	120.5	4.3	492
External Complex															
Skeet Range Building	28 F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Sewage Treatment Plant Incinerator	39 D	2.5	0.0	0.2	0.1	0.8	0.0	0.0	2.3	0.0	0.0	0.0	0.2	0.1	6
Decontamination Building	69	0.0	1.5	1.4	0.0	22.3	0.0	0.0	0.5	0.1	0.8	0.0	3.2	0.6	30
External Complex Total		2.5	1.5	1.6	0.1	23.1	0.0	0.0	2.8	0.1	0.8	0.0	3.4	0.7	37
Plant 9 Complex															
Special Products Plant	9 A	0.0	6.0	16.7	11.9	0.9	0.0	0.0	248.4	0.3	2.7	0.9	41.4	5.0	334
Plant 9 Sump Treatment Facility	9 B	0.0	0.2	0.7	0.5	0.3	0.0	0.0	2.8	0.0	0.4	0.0	0.7	0.2	6
Plant 9 Dust Collector	9 C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0
Plant 9 Substation	9 D	0.0	0.1	1.0	0.7	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.0	3
Plant 9 Cylinder Shed	9 E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Electrostatic Precipitator	9 F	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.1	1
Magnesium Storage Building	32 A	0.0	2.0	1.6	0.0	19.9	0.0	0.0	0.5	0.0	0.3	0.0	2.0	0.2	27
Building 32 Covered Loading Dock	32 B	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0	1
Thorium Warehouse	64	0.0	3.8	0.4	0.0	4.8	0.0	0.0	3.5	0.0	0.7	0.0	4.1	0.4	18
(Old) Plant 5 Warehouse	65	0.0	2.3	0.1	0.0	0.0	0.0	0.0	0.9	0.0	0.8	0.0	5.6	0.3	10
D & D Building	78	0.0	4.8	4.7	0.0	32.4	0.0	0.0	16.0	0.1	0.6	0.0	4.9	0.4	64
Plant 9 Warehouse	81	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.7	0.0	0.5	0.0	1.7	0.2	3
Thorium Complex Total		0.0	19.5	25.8	13.2	58.3	0.0	0.1	273.5	0.4	6.2	0.9	61.3	6.9	466
Boiler Plant/Water Plant Complex															
Boiler Plant	10 A	54.2	6.6	0.7	4.6	21.7	0.0	0.0	216.8	0.3	3.0	0.0	37.1	1.9	347
Boiler Plant Maintenance Building	10 B	0.0	0.3	0.1	0.0	2.3	0.0	0.0	0.5	0.0	0.0	0.0	0.8	0.1	4
Wet Salt Storage Bin	10 C	0.0	0.0	0.2	0.0	6.3	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	7
Utilities Heavy Equipment Building	10 E	0.0	0.2	0.6	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	1
Pump Station & Power Center	20 A	0.0	0.4	1.0	0.7	0.0	0.0	0.0	0.3	0.2	1.7	0.0	1.1	0.4	6
Water Plant	20 B	0.0	1.3	1.7	0.5	1.3	0.0	0.0	13.5	0.5	5.1	0.0	4.6	1.3	30
Cooling Towers	20 C	0.0	12.0	0.2	1.4	0.0	0.0	0.0	632.4	0.0	1.5	0.0	0.5	0.4	648
Process Water Storage Tank	20 H	0.0	0.0	1.4	0.0	32.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.9	35
Railroad Scale House	24 A	0.0	0.1	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
Coal Pile[2]	P-005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Boiler Plant/Water Plant Complex Total		54.2	20.9	5.8	7.2	65.2	0.0	0.0	863.8	1.0	11.6	0.0	44.6	5.2	1,080
Tank Farm Complex															
Main Tank Farm	19 A	0.0	0.1	0.5	0.0	9.6	0.0	0.0	74.7	0.0	0.9	0.0	4.6	0.7	91
Tank Farm Control House	19 C	0.0	0.3	0.7	0.0	5.2	0.0	0.0	1.2	0.0	0.0	0.0	0.3	0.1	8
Old North Tank Farm	19 D	0.0	0.0	0.5	0.0	1.9	0.0	0.0	42.8	0.0	0.0	0.0	0.0	0.3	46
Tank Farm Lime Slitter Building	19 E	0.0	0.1	0.2	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.6	0.1	3
Tank Farm Complex Total		0.0	0.5	1.8	0.0	16.7	0.0	0.0	120.9	0.0	0.9	0.0	5.4	1.2	147
Plant 1 Complex															
Preparaton Plant	1 A	0.1	2.6	13.6	8.8	19.9	0.0	0.0	150.4	0.7	6.7	0.8	33.9	6.4	244
Plant 1 Storage Shelter	1 B	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.6	0.2	4
Chemical Warehouse	30 A	0.0	3.7	2.9	5.8	1.3	0.0	0.0	1.8	0.0	1.4	0.0	12.8	0.8	31
Drum Storage Warehouse	30 B	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	1
CP Storage Warehouse	56 A	0.0	1.8	0.4	0.0	0.0	0.0	0.0	0.6	0.0	0.4	0.0	2.8	0.3	6
Storage Shed (West)	56 B	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1
Storage Shed (East)	56 C	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1
Quonset Hut #1	60	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.0	0.0	2
Quonset Hut #2	61	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.1	1
Quonset Hut #3	62	5.6	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.0	7
KC-2 Warehouse	63	0.8	6.2	7.1	0.0	36.3	0.0	0.0	1.7	0.0	1.0	0.0	7.7	0.5	61
Drum Reconditioning Building	66	0.0	0.5	0.7	0.0	0.0	0.0	0.0	20.6	0.1	0.7	0.0	1.0	0.6	24
Plant 1 Thorium Warehouse	67	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.4	0.3	4
General In-Process Warehouse	71	0.0	5.5	6.6	0.0	21.3	0.0	0.0	1.3	0.0	0.3	0.0	4.8	0.5	40
Drum Storage Building	72	0.0	0.1	0.4	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.1	0.2	2
Tension Support Structure #4	TS-004	0.0	0.7	0.3	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	8.4	0.2	12
Tension Support Structure #5	TS-005	0.0	0.8	0.3	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	8.4	0.2	12
Tension Support Structure #6	TS-006	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.9	0.1	1
Plant 1 Complex Total		6.6	24.8	33.8	15.0	78.7	0.0	0.0	182.8	0.8	10.6	0.8	88.9	10.8	454

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TABLE B–4 Container Estimates for OU3 Materials

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Container Type: [1]		R/O	R/O	R/O	R/O	R/O	WMB	R/O	T/L	T/L	R/O	R/O	R/O	R/O	
Restricted by Weight or Volume:		weight	volume	volume	weight	weight	weight	weight	volume	weight	weight	volume	volume	volume	
Maintenance Complex															
Main Maintenance Building	12 A	1.5	11.3	23.4	15.3	105.3	0.0	0.0	31.9	0.1	0.6	0.1	30.0	1.5	221
Cylinder Storage Building	12 B	0.0	0.4	0.6	0.0	6.2	0.0	0.0	0.4	0.0	0.0	0.0	0.3	0.1	8
Lumber Storage Building	12 C	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.1	1
Maintenance Building Warehouse	12 D	0.0	0.2	2.3	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.0	1.1	0.3	5
Railroad Engine House	24 B	0.0	0.4	0.5	0.0	6.9	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.1	9
Propane Storage	38 A	0.0	0.2	0.3	0.0	5.6	0.0	0.0	0.3	0.1	1.1	0.0	0.2	0.5	8
Cylinder Filling Staton	38 B	0.0	0.0	0.4	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.3	8
Maintenance Complex Total		1.5	12.8	27.7	15.3	123.9	0.0	0.0	40.8	0.2	2.1	0.1	32.4	2.8	260
East Warehouses Complex															
Elevated Potable Storage Tank	20 D	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.0	10.7	0.2	12
Finished Products Warehouse (4A Warehouse)	77	0.0	0.3	0.2	0.0	0.0	0.0	0.0	1.3	0.0	1.3	0.0	4.2	0.4	8
Plant 6 Warehouse	79	0.0	0.3	0.1	0.0	0.0	0.0	0.0	1.3	0.0	0.9	0.0	3.5	0.3	7
Receiving/Incoming Materials Inspection	82	0.0	1.4	0.1	0.0	9.5	0.0	0.0	2.2	0.0	0.2	0.0	2.5	0.3	16
East Warehouses Complex Total		0.0	2.0	1.0	0.0	9.5	0.0	0.0	5.0	0.0	3.0	0.0	21.0	1.2	43
Plant 3 Complex															
Ozone Building	3 B	0.0	0.1	0.3	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.2	2
NAR Control House	3 C	0.0	0.3	2.3	1.3	0.0	0.0	0.0	28.0	0.0	0.4	0.0	1.5	0.4	34
NAR Towers	3 D	0.0	0.0	0.9	0.1	0.0	0.0	0.0	145.9	0.0	4.5	0.0	7.8	1.6	161
Hot Raffinate Building	3 E	0.0	0.8	1.0	1.8	23.5	0.0	0.0	88.6	0.1	1.1	0.0	4.0	1.1	122
Harshaw Digestion Fume Recovery	3 F	0.0	0.0	0.3	0.0	0.0	0.0	0.0	3.8	0.0	0.2	0.0	2.5	0.3	7
Refrigeration Building	3 G	0.0	0.0	0.8	0.4	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.4	0.1	5
Combined Raffinate Tanks	3 J	0.0	0.0	0.7	0.0	0.0	0.0	0.0	58.2	0.0	0.6	0.0	2.1	0.7	62
Old Cooling Water Tower	3 K	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1
Incinerator Building	39 A	1.5	0.5	1.2	1.6	0.0	0.0	0.0	0.6	0.1	0.5	0.0	3.8	0.5	10
Incinerator Sprinkler Riser House	39 C	0.0	0.0	0.1	0.0	1.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.1	2
Plant 3 Complex Total		1.5	1.9	7.8	5.6	24.8	0.0	0.0	330.1	0.2	7.4	0.0	22.9	5.2	407
Plant 2 Complex															
Ore Refinery Plant	2 A	0.1	8.4	12.5	13.4	35.2	8.2	0.2	543.5	0.4	4.1	0.5	76.7	4.0	707
Metal Dissolver Building	2 D	0.0	0.8	2.3	1.1	0.0	0.0	0.0	33.9	0.0	0.4	0.0	2.8	0.7	42
NFS Storage and Pump House	2 E	0.0	0.1	0.3	0.0	2.1	0.0	0.0	24.8	0.0	0.9	0.0	0.1	0.6	29
Cold Side Ore Conveyor	2 F	0.0	0.1	0.3	0.3	0.0	0.0	0.0	21.9	0.0	0.0	0.0	0.9	0.2	24
Hot Side Ore Conveyor	2 G	0.0	0.0	0.2	0.2	0.0	0.0	0.0	28.5	0.0	0.1	0.0	0.8	0.2	30
Waste Oil Decant Shelter	39 B	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.1	1
Plant 2 Complex Total		0.1	9.4	15.8	15.0	37.3	8.2	0.2	652.7	0.5	5.5	0.5	81.7	5.8	833
Plant 8 Complex															
Recovery Plant	8 A	0.0	13.4	17.3	11.3	28.2	0.0	0.1	231.5	1.6	15.6	0.3	48.4	7.0	375
Plant 8 Maintenance Building	8 B	0.0	1.6	0.4	0.0	9.7	0.0	0.0	0.2	0.0	0.1	0.0	0.7	0.3	13
Rotary Kiln/Drum Reconditioning	8 C	0.0	4.9	7.3	0.0	15.1	0.0	0.0	136.5	0.0	0.1	0.1	32.1	0.7	197
Plant 8 Railroad Filter Building	8 D	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0
Drum Conveyor Shelter	8 E	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.0	1
Plant 8 Old Drum Washer	8 F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Plant 8 Warehouse	80	0.0	0.2	0.6	0.0	0.0	0.0	0.0	0.7	0.0	0.3	0.0	2.1	0.5	4
Plant 8 Complex Total		0.0	20.1	25.7	11.3	52.9	0.0	0.1	369.1	1.7	16.2	0.3	83.9	8.5	590
General Sump Complex															
General/Refinery Sump Control Building	2 B	0.0	0.4	1.7	0.6	0.7	0.0	0.0	25.5	0.0	0.0	0.0	2.3	0.4	32
Bulk Lime Handling Building	2 C	0.0	0.3	0.2	0.3	0.0	0.0	0.0	8.0	0.0	0.3	0.0	0.6	0.2	10
Maintenance Building	3 A	0.0	0.4	2.4	1.5	0.0	0.0	0.0	34.5	0.0	0.2	0.0	2.0	0.4	41
Refinery Sump	3 H	0.0	0.0	0.5	0.0	0.0	0.0	0.0	45.9	0.0	0.8	0.0	1.3	0.7	49
Electrical Power Center Building	3 L	0.0	0.2	1.7	0.9	0.0	0.0	0.0	21.5	0.0	0.0	0.0	1.1	0.3	26
General Sump	18 B	0.0	0.3	0.9	0.0	0.0	0.0	0.0	5.0	0.0	1.5	0.0	1.3	1.1	10
Biodenitrification Towers	18 D	0.0	2.4	4.9	0.0	0.0	0.0	0.0	22.4	0.1	0.8	0.0	11.5	0.9	43
BDN Effluent Treatment Facility	18 H	0.0	0.2	1.0	0.0	0.0	0.0	0.0	135.5	0.0	0.1	0.0	0.2	0.3	137
General Sump Complex Total		0.0	4.3	13.4	3.2	0.7	0.0	0.0	298.1	0.2	3.8	0.0	20.3	4.4	348

TABLE B-4 Container Estimates for OU3 Materials

Component	Component Designation	A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
		OU3 RD/RA Material Category													
Container Type: [1]		R/O	R/O	R/O	R/O	R/O	WMB	R/O	T/L	T/L	R/O	R/O	R/O	R/O	
Restricted by Weight or Volume:		weight	volume	volume	weight	weight	weight	weight	volume	weight	weight	volume	volume	volume	
Plant 5 Complex															
Plant 4 Warehouse	4 B	0.0	0.5	0.4	0.0	0.0	0.0	0.0	1.1	0.0	0.5	0.0	3.4	0.4	6
Metals Production Plant	5 A	22.9	11.7	18.7	17.6	76.3	0.0	0.1	679.3	0.9	8.3	1.1	104.9	8.2	950
Plant 5 Ingot Pickling	5 B	0.0	0.1	0.4	0.0	0.0	0.0	0.0	9.9	0.0	0.2	0.0	1.2	0.3	12
Plant 5 Electrical Substation	5 C	0.0	0.1	0.2	0.0	0.0	0.0	0.0	2.6	0.0	0.3	0.0	0.2	0.2	4
West Derby Breakout/ Slag Milling	5 D	0.0	0.3	1.2	0.0	0.9	0.0	0.0	86.9	0.1	1.0	0.0	32.0	1.3	124
Plant 5 Filter Building	5 E	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.8	0.1	2
Plant 5 Covered Storage Pad	5 F	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	3.0	0.1	4
Plant 5 Ingot Storage Shelter	5 G	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.0	1
Slag Recycling Building	55 A	0.0	1.3	2.5	1.7	0.0	0.0	0.0	24.1	0.0	0.0	0.0	6.4	0.6	37
Slag Recycling Flt/Elevator	55 B	0.0	0.0	0.2	0.3	0.0	0.0	0.0	1.8	0.0	0.1	0.0	1.2	0.2	4
Plant 5 Complex Total		22.9	14.9	24.0	19.6	77.2	0.0	0.1	806.9	1.0	10.4	1.2	153.5	11.6	1,143
Plant 6 Complex															
Metals Fabrication Plant	6 A	1.5	17.4	1.4	35.0	34.3	0.0	0.0	725.8	1.1	10.4	0.7	112.4	6.4	946
Plant 6 Covered Storage Area	6 B	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.9	0.2	1
Plant 6 Electrostatic Precipitator (South)	6 C	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.3	0.2	1
Plant 6 Electrostatic Precipitator (Central)	6 D	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	1
Plant 6 Electrostatic Precipitator (North)	6 E	0.0	0.0	0.2	0.0	0.0	0.0	0.0	2.2	0.0	0.1	0.0	0.3	0.2	3
Plant 6 Salt Oil Heat Treat Building	6 F	0.0	0.1	0.4	0.0	0.0	0.0	0.0	5.4	0.3	2.7	0.0	0.4	1.2	11
Plant 6 Sump Building	6 G	0.0	0.2	2.8	0.1	0.9	0.0	0.0	33.6	0.3	2.8	0.0	7.6	1.1	49
Plant 6 Complex Total		1.5	17.7	5.4	35.1	35.2	0.0	0.0	767.2	1.7	16.1	0.8	122.0	9.5	1,012
Liquid Storage Complex															
Methanol Tank	18 J	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.1	0.0	0.1	0.0	0.4	0.0	2
Low Nitrate Tank	18 K	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.2	0.0	2
High Nitrate Tank	18 L	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.2	0.0	2
Well House #1	20 E	0.0	0.1	0.1	0.0	1.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	2
Well House #2	20 F	0.0	0.1	0.1	0.0	1.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	2
Well House #3	20 G	0.0	0.2	0.1	0.0	1.6	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.1	3
Gas Meter Building	22 A	0.0	0.1	0.1	0.0	2.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	3
Storm Sewer Lift Station	22 B	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.9	0.0	0.1	0.0	0.0	0.1	2
Scale House & Weigh Scale	22 D	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0
Pump House-HP Fire Protection	26 A	0.0	0.5	0.5	0.0	23.0	0.0	0.0	1.5	0.0	0.5	0.0	3.5	0.2	30
Elevated Water Storage Tank	26 B	0.0	0.0	0.2	0.0	2.1	0.0	0.0	0.4	0.0	1.2	0.0	36.4	0.3	41
Rust Engineering Building	45 A	0.0	2.2	0.5	0.0	12.0	0.0	0.0	7.2	0.0	0.7	0.1	3.5	0.9	27
Utility Shed East of Rust Trailers	45 B	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0
Liquid Storage Complex Total		0.0	3.8	2.3	0.1	45.7	0.0	0.0	14.8	0.1	2.6	0.1	44.2	2.2	116
Pilot Plant Complex															
Pilot Plant Wet Side	13 A	0.0	4.9	3.2	1.2	41.3	0.0	0.0	59.8	0.5	4.9	0.0	3.5	2.3	122
Pilot Plant Maintenance Building	13 B	0.0	0.9	0.6	0.0	13.3	0.0	0.0	0.6	0.0	0.1	0.0	0.2	0.1	16
Sump Pump House	13 C	0.0	0.1	0.1	0.0	1.3	0.0	0.0	1.0	0.0	0.2	0.0	0.1	0.2	3
Pilot Plant Thorium Tank Farm	13 D	0.0	0.0	0.3	0.0	0.0	0.0	0.0	34.3	0.0	0.3	0.0	0.0	0.3	35
Pilot Plant Annex	37	0.0	1.6	1.9	0.0	24.6	0.0	0.0	40.6	0.1	0.9	0.0	3.0	0.5	73
Six to Four Reduction Facility #1	54 A	0.0	4.3	6.0	0.7	41.5	0.0	0.0	100.0	0.1	1.2	0.1	11.7	2.4	168
Pilot Plant Shelter	54 B	0.0	0.1	1.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5	0.7	3
Pilot Plant Dissociator Shelter	54 C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.2	0.0	0.5	0.1	7
Pilot Plant Warehouse	66	0.0	0.5	0.4	1.2	3.2	0.0	0.0	1.2	0.0	0.0	0.0	3.2	0.3	10
Pilot Plant Complex Total		0.0	12.5	13.6	3.2	125.3	0.0	0.0	243.6	0.8	7.8	0.2	22.7	6.8	436
Laboratory Complex															
Laboratory	15 A	0.0	45.3	20.8	0.1	336.3	0.0	0.0	107.9	1.5	14.6	1.3	18.4	11.0	557
Laboratory Chemical Storage Building	15 B	0.0	0.0	0.0	0.0	3.4	0.0	0.0	1.9	0.0	0.0	0.0	0.3	0.1	6
Laboratory Complex Total		0.0	45.3	20.8	0.1	339.7	0.0	0.0	109.8	1.5	14.6	1.3	18.7	11.0	563

TABLE B-4 Container Estimates for OU3 Materials

Component	Component Designation	OU3 RD/RA Material Category: A Non-Reg., Non-Friable ACM	B Construction Debris	C Compactible Waste	D Transite	F Masonry, Concrete, Asphalt	G Acid Brick	H Specialty Metals	I Restricted Use Metals	J Process Piping	K Non-Process Piping	L Ductwork	N Unrestricted Use Metals	P Regulated, Friable ACM	Component/ Complex Totals
Container Type: [1]		R/O	R/O	R/O	R/O	R/O	WMB	R/O	T/L	T/L	R/O	R/O	R/O	R/O	
Restricted by Weight or Volume:		weight	volume	volume	weight	weight	weight	weight	volume	weight	weight	volume	volume	volume	
Electrical Station Complex															
Main Electrical Station	16 A	0.0	0.7	0.2	0.0	7.3	0.0	0.0	14.8	0.0	0.0	0.0	2.0	0.1	25
Electrical Substation	16 B	0.0	2.4	0.2	0.0	3.5	0.0	0.0	3.6	0.0	0.0	0.0	0.1	0.0	10
Electrical Panels & Transformer	16 C	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	1
Main Electrical Switch House	16 D	0.0	0.0	0.2	0.1	3.0	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.1	5
Main Electrical Transformers	16 E	0.0	24.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	25
Trailer Substation #1	16 F	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.0	1
Trailer Substation #2	16 G	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.0	1
Main Electrical Strainer House	26 C	0.0	0.0	0.2	0.0	1.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	2
Engine House/Garage	31 A	0.0	2.6	2.1	0.0	17.9	0.0	0.0	2.2	0.0	0.3	0.0	2.6	0.2	28
Heavy Equipment Building	46	0.0	1.9	0.3	0.0	4.1	0.0	0.0	1.2	0.0	0.4	0.0	4.5	0.3	13
Electrical Station Complex Total		0.0	32.4	3.4	0.1	36.9	0.0	0.0	25.1	0.1	0.7	0.0	9.4	1.1	109
Sewage Treatment Plant Complex															
Chlorination Building	25 A	0.0	0.2	0.1	0.0	1.8	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	2
M.H.#175/Eff. Line/Sampling Building	25 B	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	1
Sewage Lift Station Building	25 C	0.0	0.1	0.1	0.0	2.1	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.0	3
U.V. Disinfection Building	25 D	0.0	0.0	0.1	0.0	1.3	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.1	2
Digester & Control Building	25 E	0.0	0.2	0.3	0.0	15.2	0.0	0.0	1.1	0.0	0.3	0.0	0.6	0.2	18
Sewage Treatment Plant Complex Total		0.0	0.5	0.6	0.0	20.4	0.0	0.0	2.8	0.0	0.3	0.0	0.7	0.4	26
Administration Complex															
Service Building	11	12.7	17.9	18.4	0.0	586.6	0.0	0.0	89.9	0.0	11.8	0.6	3.4	4.9	746
Administration Building	14 A	3.2	23.3	4.5	0.0	169.9	0.0	0.0	34.2	0.0	1.4	0.1	1.1	0.9	239
Building 14 EOC Generator Set	14 B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1
Security Building	28 A	0.0	4.9	2.9	0.0	32.4	0.0	0.0	2.5	0.0	0.0	0.0	0.2	0.1	43
Human Resources Building	28 B	0.0	7.4	2.2	0.0	12.7	0.0	0.0	3.2	0.0	0.1	0.1	4.8	0.3	31
Health & Safety Building	53 A	6.9	46.7	7.2	0.0	167.7	0.0	0.0	19.6	0.0	2.6	0.4	6.9	2.2	280
In-Vivo Building	53 B	0.0	1.9	1.7	0.0	0.0	0.0	0.0	4.5	0.0	0.1	0.0	0.5	0.1	9
Administration Complex Total		22.8	102.0	36.9	0.0	989.2	0.0	0.0	154.9	0.0	15.8	1.2	16.9	8.6	1,348
Miscellaneous Complex															
10-Plex North Substation	16 H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3
10-Plex South Substation	16 J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3
Clearwell Pump House	18 G	0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.0	1
Meteorological Tower	23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0
10-Plex Sewage Lift Station	25 J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0
Guard Post on West End of 2nd Street	28 D	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1
Guard Post East of T-81	28 E	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Guard Post South of Building 51	28 G	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Utility Lines	G-004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	1.0	46.7	0.0	0.0	50.8	106
Process Trailers	G-006	0.0	175.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	176
Non-Process Trailers	G-007	0.0	753.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	753
Pipe Bridges	G-008	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	46.6	0.0	48
Miscellaneous Complex Total		0.0	929.9	0.3	0.1	1.4	0.0	0.0	14.0	1.0	46.7	0.0	46.9	50.9	1,091
Below Grade Components		57.1	67.7	0.0	0.0	15,655.3	417.8	0.0	0.7	43.0	140.0	0.0	200.8	0.0	16,582
Operable Unit 3 Total		176	1,353	281	160	17,818	426	1	5,597	55	329	8	1,222	159	27,584

[1] Top-loading containers (T/L) hold 971 cubic feet and/or 18.00 tons of material; roll-off containers (R/O) hold 810 cubic feet and/or 16.95 tons of material; and white metal boxes (WMB) hold 82 cubic feet and/or 3.40 tons of material

[2] The quantities of stockpiled coal vary seasonally. No significant quantities of coal are expected to remain after the Boiler Plant/Water Plant Complex is shut down.

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APPENDIX C

MAPS OF OU3 COMPLEXES

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APPENDIX C
MAPS OF OU3 COMPLEXES

This appendix contains figures showing the location of, and components contained within, each of the above-grade complexes listed in Table 3-2 within the former Production Area, with the exception of the Miscellaneous Complex. As discussed in Section 3, components contained in the Miscellaneous Complex will not be scheduled as a single unit but will be dismantled throughout the OU3 interim remedial action on an as-needed basis as part of other projects. The components within each complex have been filled with a hatching pattern on each of the complex maps. Small circles have been filled and used in some cases, due to the inability to pattern smaller components.

As a supplement to the discussion in Section 3 regarding the process of assembling components into complexes, the reverse side of each complex map in this appendix contains a brief explanation as to why each of the components were included into that particular complex.

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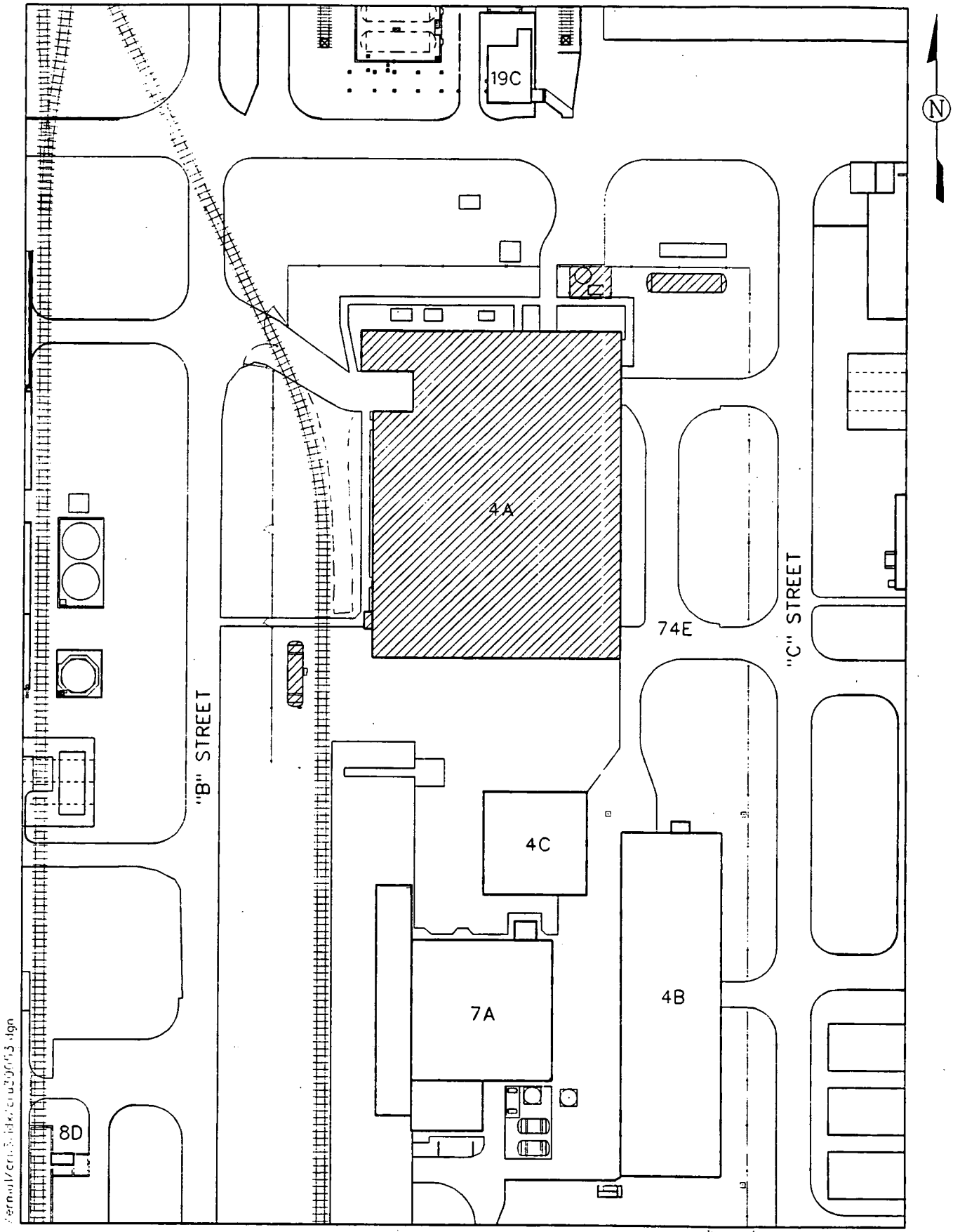

FIGURE C-1 Building 4A

Basis for Assembly of the Plant 4 Complex
(Component: 4A)

- Building 4A is the only remaining component within the Plant 4 processing facility and is currently available for remediation within the city block located between 1st and 2nd streets and between "B" and "C" Streets.

- The size and location of Building 4A does not allow it to be placed into another complex. Its remediation will complete clearing of the block associated with Plant 7 except for Building 4B, a warehouse necessary for the storage of current nuclear product inventories.

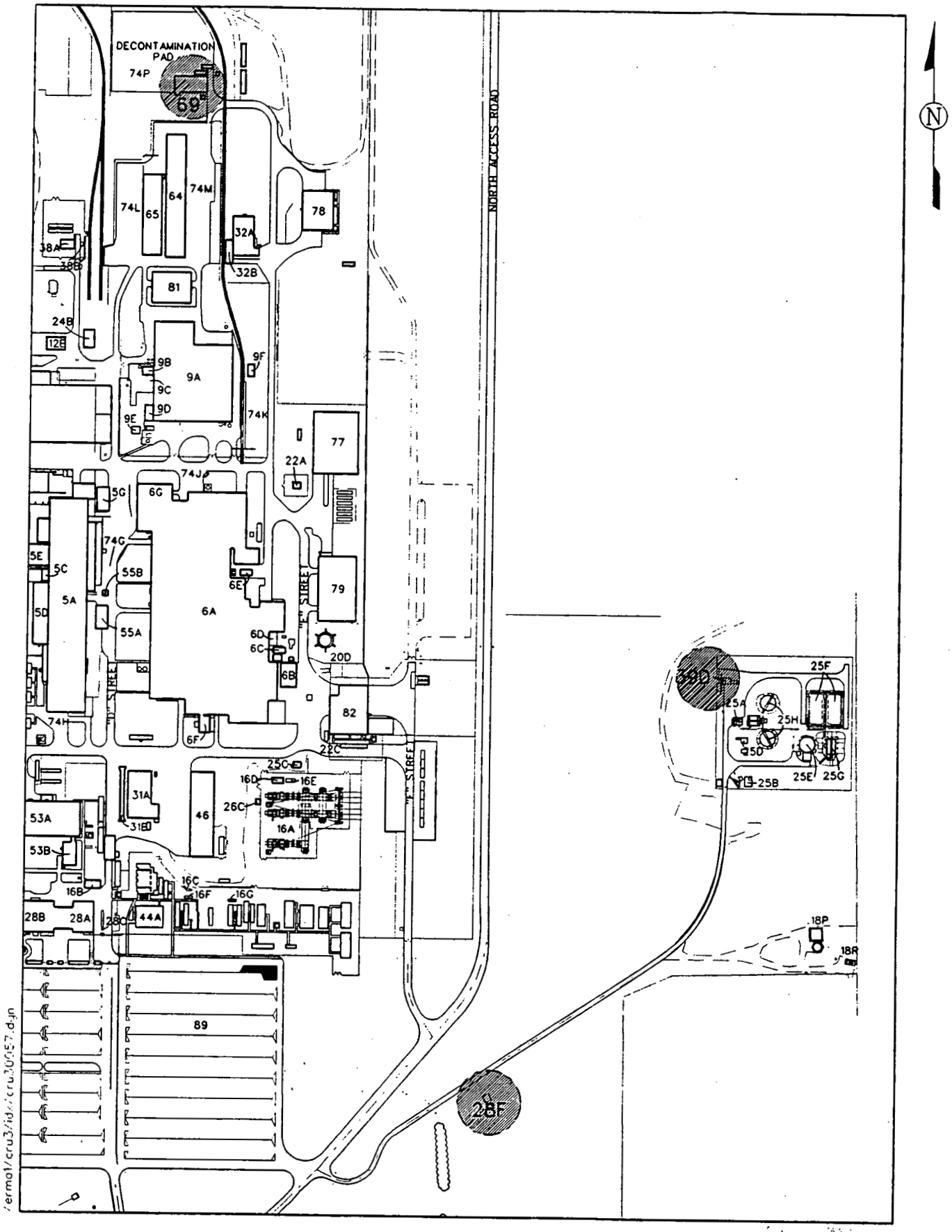

FIGURE C-2 External Complex

Basis for Assembly of the External Complex
(Components: 28F, 39D, 69)

- These components are not integrally related to components/processes from other complexes. Also, these components are immediately available for remediation.

- These components represent a complex that consists of structures having simple construction that may be remediated at any time without impacting other areas of the site.

- The cost to remediate this complex is comparatively low. It is anticipated that this complex may be dismantled if unexpected incremental funding becomes available.

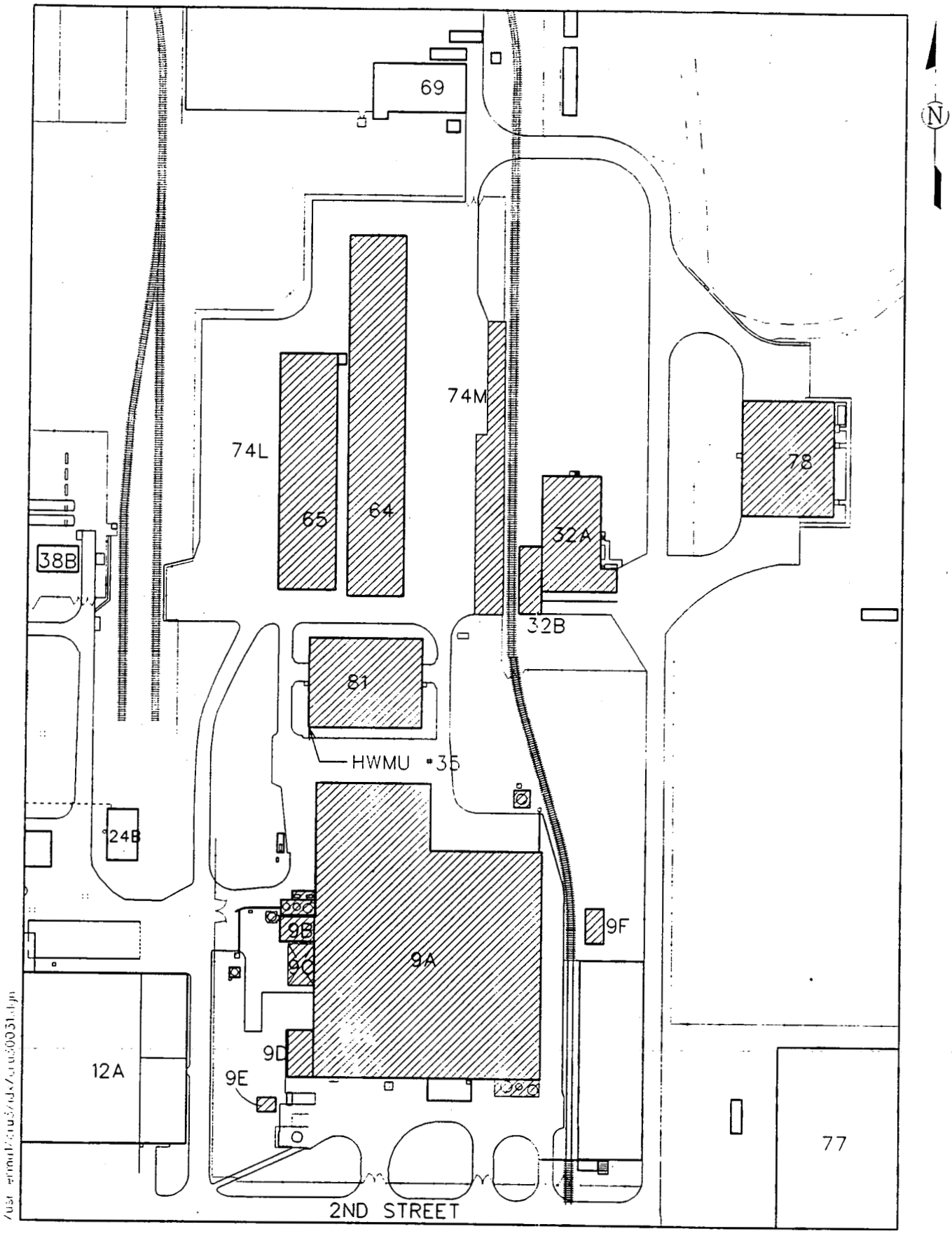

FIGURE C-3 Thorium/Plant 9 Complex

Basis for Assembly of the Thorium/Plant 9 Complex
(Components: 9A, 9B, 9C, 9D, 9E, 9F, 32A, 32B, 64, 65, 78, and 81)

- All of these components are located within the northeast quadrant of the former Production Area and represent a reasonably-sized complex of similar structures for remediation. Remediation of the components within this quadrant would have minimal impacts on surrounding areas while providing a controlled work area.

- Components 9B, 9C, 9D, 9E, and 9F functioned in support of Component 9A (Special Products Plant), and are therefore highly connected and similarly contaminated.

- Components 9A, 9C, 32A, 32B, 64, 65, and 81 are currently supporting various functions and thus make the complex not available for remediation until 12/96.

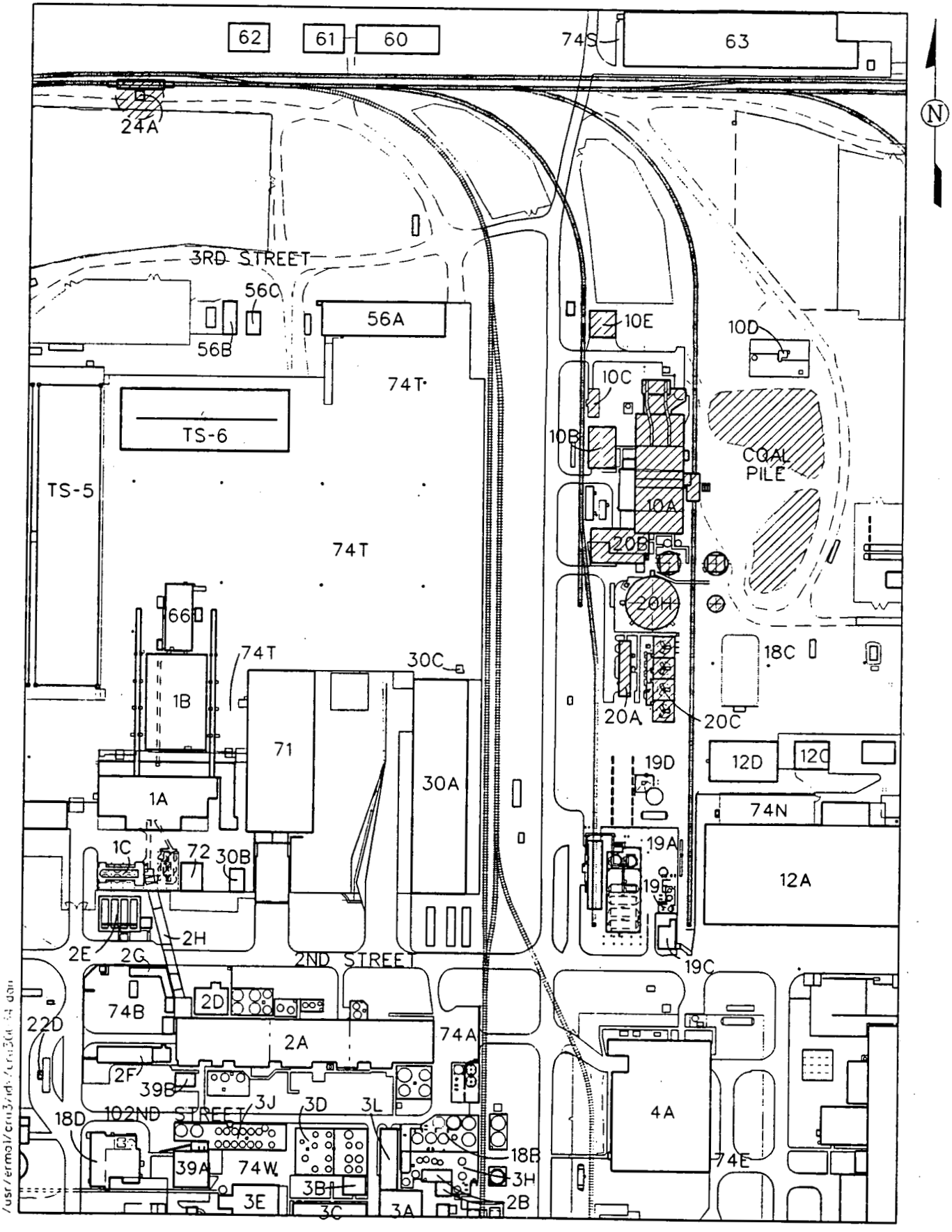

FIGURE C-4 Boiler Plant/Water Plant Complex

Basis for Assembly of the Boiler Plant/Water Plant Complex
(Components: 10A, 10B, 10C, 10E, 20A, 20B, 20C, 20H, 24A, P-005)

- Components 10B, 10C, 10E, 20A, 20B, 20C, 20H, and P-005 (Coal Pile) are all integrally related to the production of steam for the site by the Boiler Plant (10A) and are in very close proximity to each other.

- The Railroad Scale House (24A) is within the general vicinity of the other components in the complex (northeast quadrant) and lies along the railroad tracks that lead to the Boiler Plant. It was also used to weigh incoming coal for the Boiler Plant.

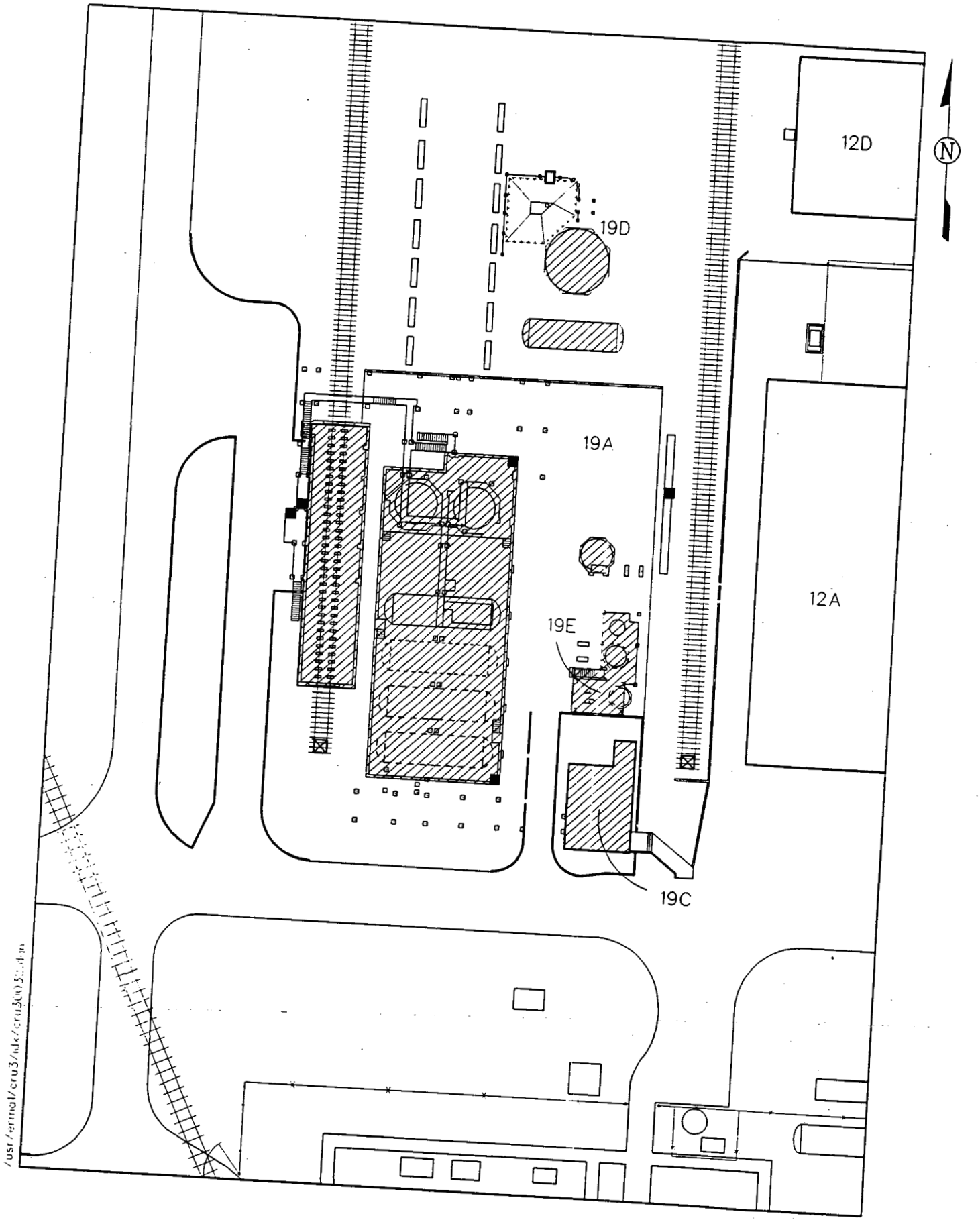

FIGURE C-5 Tank Farm Complex

Basis for Assembly of the Tank Farm Complex
(Components: 19A, 19C, 19D, 19E)

- All of these components share a relatively small, compact area situated at the northeast corner of 2nd and "B" Streets.
- Each of these components are structurally similar, and associated with the original bulk storage mission.

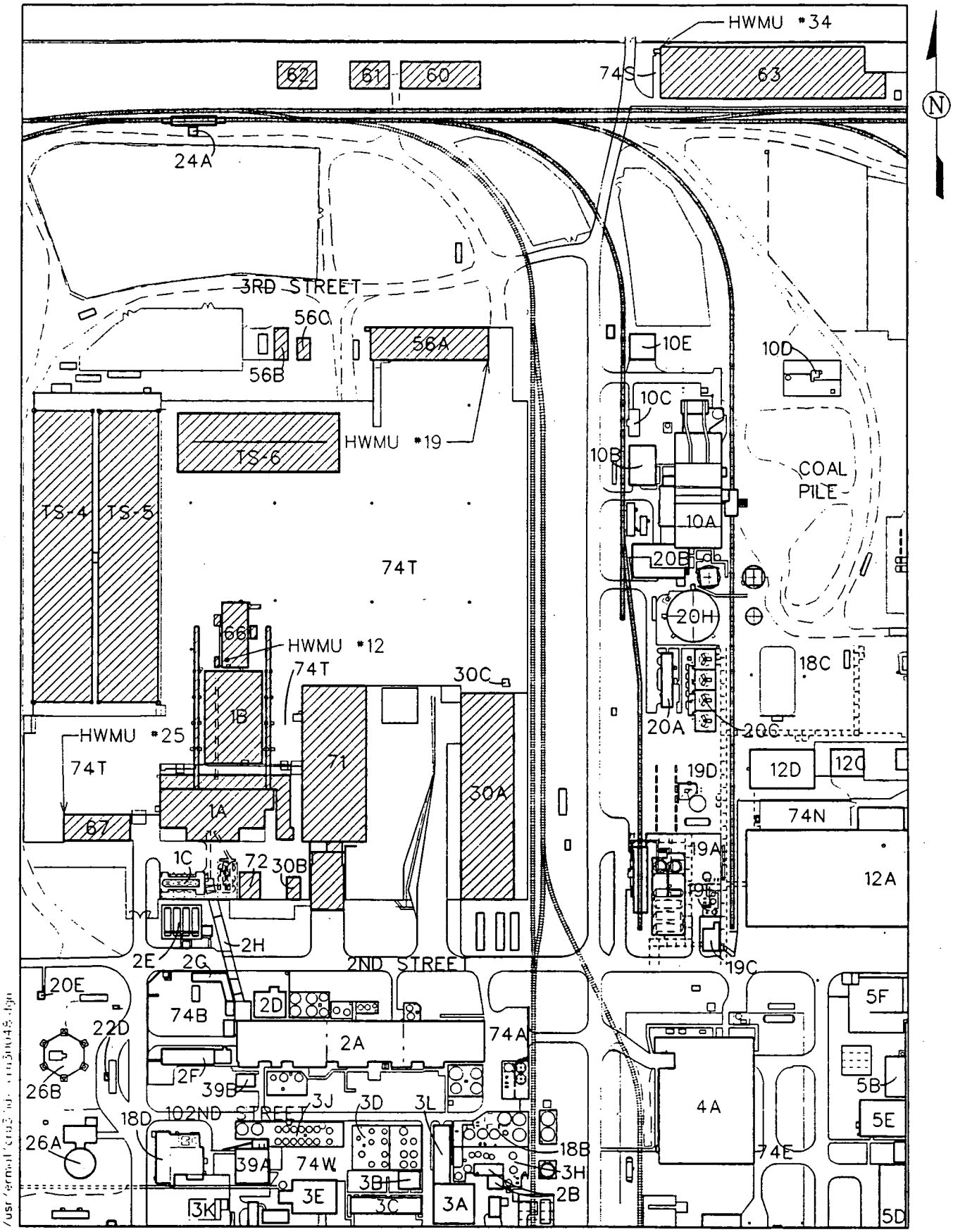

FIGURE C-6 Plant 1 Complex

Basis for Assembly of the Plant 1 Complex
(Components: 1A, 1B, 30A, 30B, 56A, 56B, 56C, 60, 61, 62, 63, 66, 67, 71, 72, TS-004 through TS-006)

- This complex is centered around Component 1A, the Preparation Plant.
- The northwest quadrant of the former Production Area is almost exclusively occupied by the Plant 1 Complex; therefore, remediation will result in few impacts to the remainder of the site.
- Components not currently used for waste management/storage (1A, 30B, 56B, 56C, 66, 67, and 72) are available for remediation. Components used for waste management/storage are anticipated to be available after final waste disposition plans are executed.

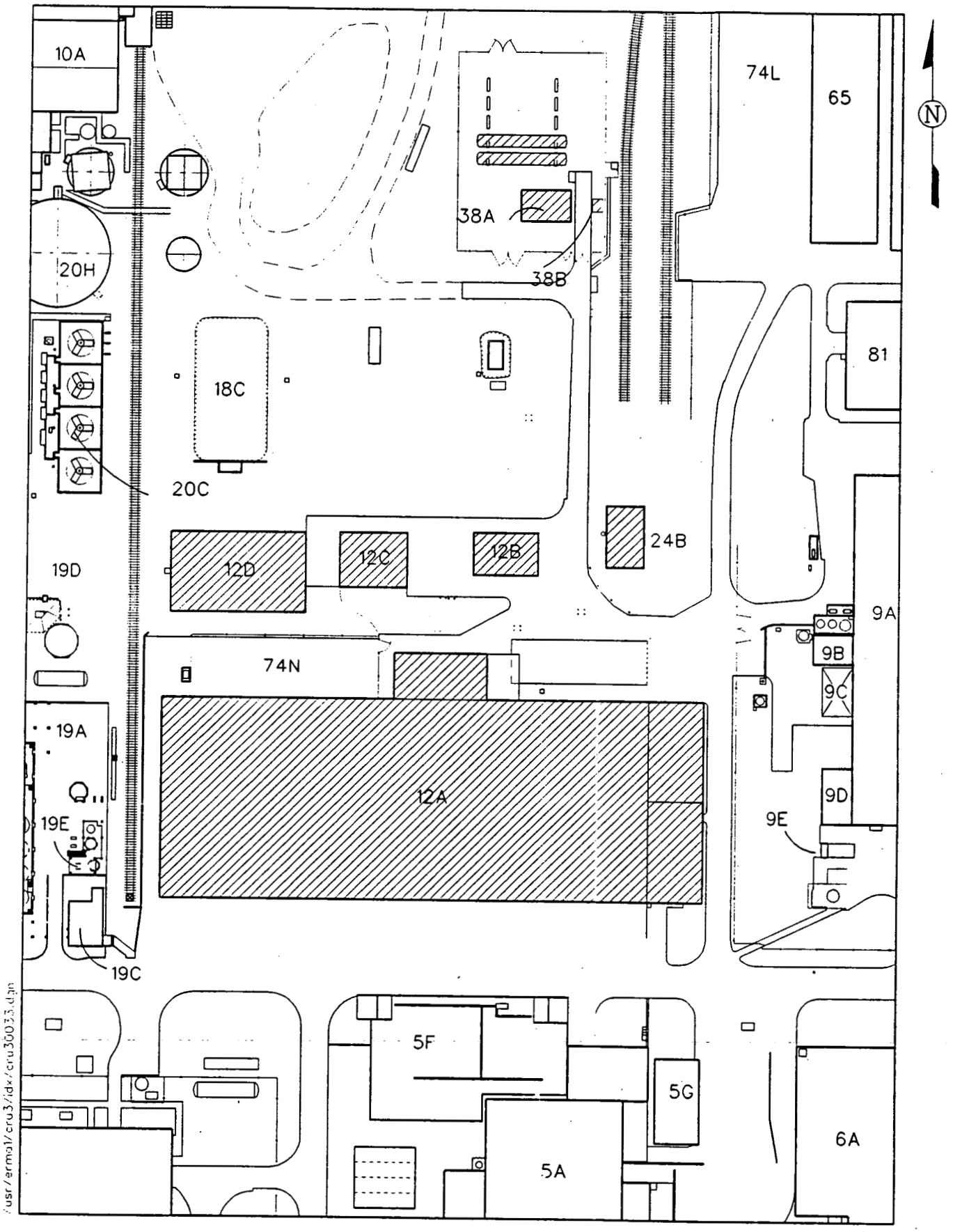

FIGURE C-7 Maintenance Complex

Basis for Assembly of the Maintenance Complex
(Components: 12A, 12B, 12C, 12D, 24B, 38A, 38B)

- One section of a city block is occupied by these components which allows for a safe, controlled construction zone.
- Each component has a role in the maintenance support function at the site, which upon completion of safe shutdown of all OU3 components, is expected to be significantly reduced, allowing for the relocation of maintenance activities.
- Component 12A (Main Maintenance Building) and 12B would be available for remediation at the same time (when maintenance needs are reduced); Components 12C, 12D, 24B, 38A, and 38B are currently available for remediation.

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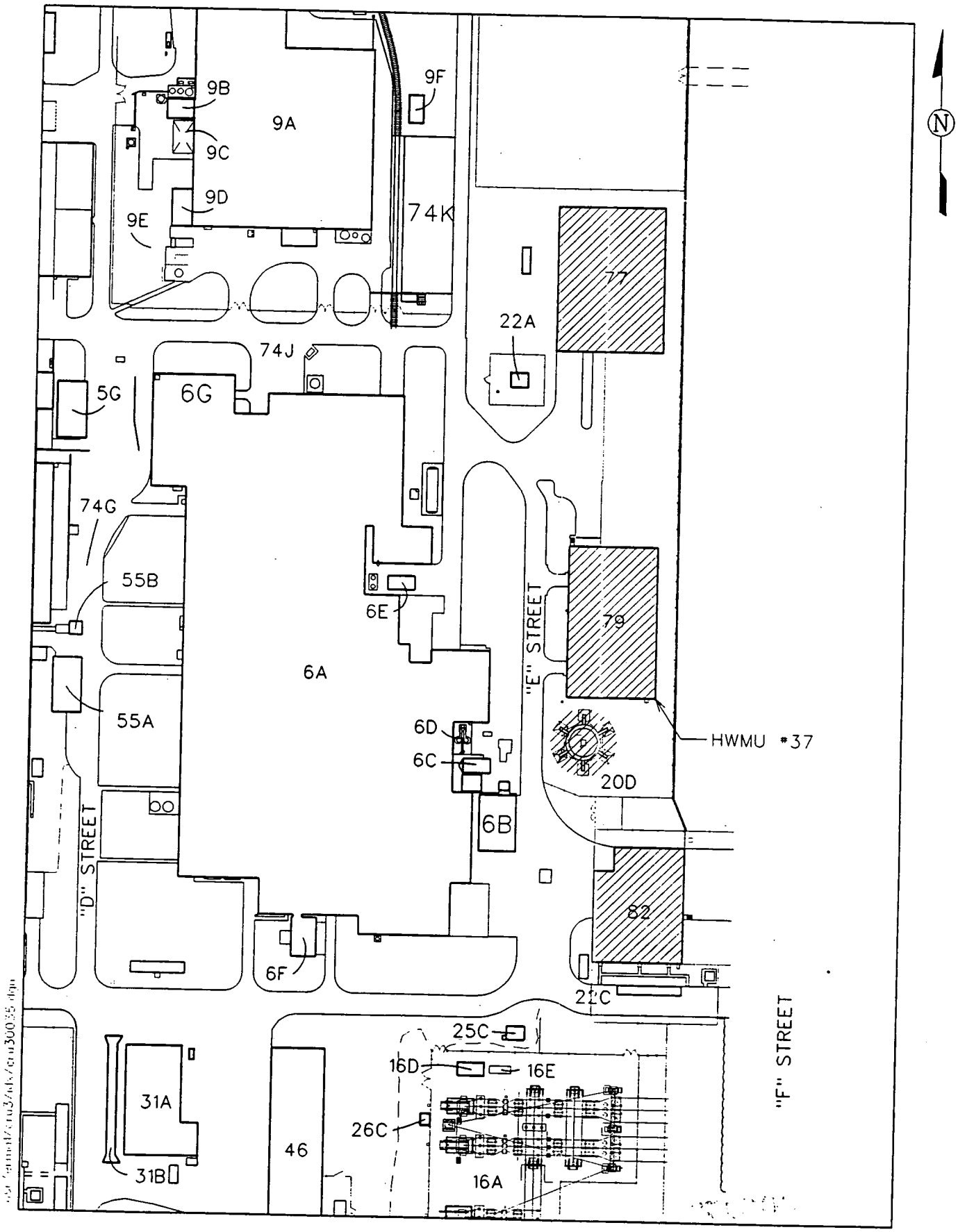

FIGURE C-8 East Warehouses Complex

Basis for Assembly of the East Warehouses Complex
(Components: 20D, 77, 79, 82)

- All four components lie along the eastern boundary of the former Production Area within roughly the same city block. The three warehouses are grouped based on future use and construction similarities. Additionally, Component 20D was included because of its proximity to these warehouses.

- All four components are expected to be available within the same time frame, after completion of the warehousing mission.

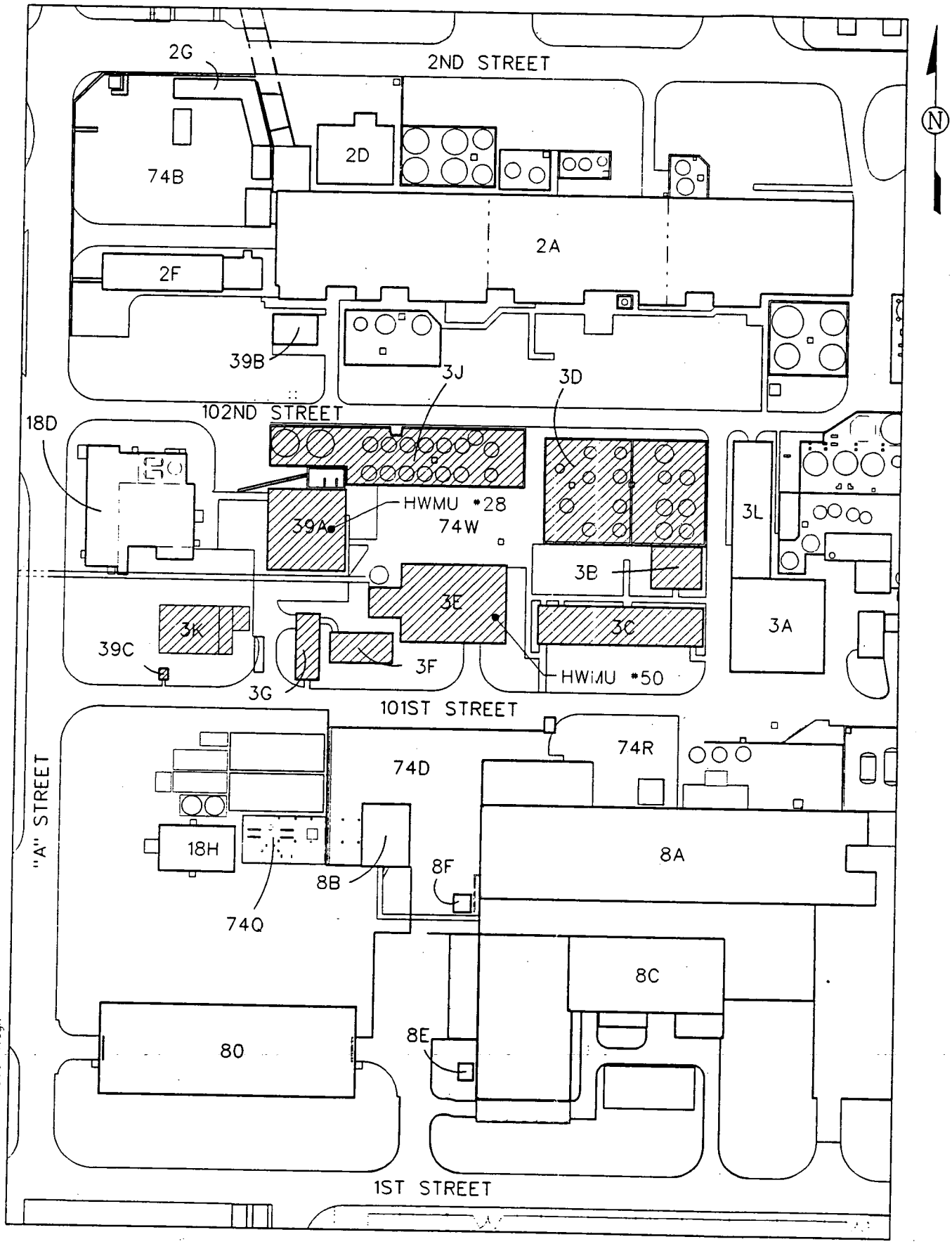

FIGURE C-9 Plant 3 Complex

Basis for Assembly of the Plant 3 Complex
(Components: 3B, 3C, 3D, 3E, 3F, 3G, 3J, 3K, 39A, 39C)

- This complex, which is located between the General Sump Complex and the Plant 2 Complex, is considered part of one of the FEMP's main process facilities: Plant 2/3. Since the entire Plant 2/3 process area was considered too large to include in one complex, the Plant 2/3 structures were separated into two complexes - in a manner that provides for maneuverability of construction equipment and other dismantlement activities.

- These components are located in a square located in the center of a city block which allows for a controlled work area and access by construction equipment.

- The Plant 3 Complex would be remediated first to increase accessibility to the larger Plant 2 and Plant 8 Complexes.

- Each of these components will not be needed after the end of 1995 and will therefore be available for remediation.

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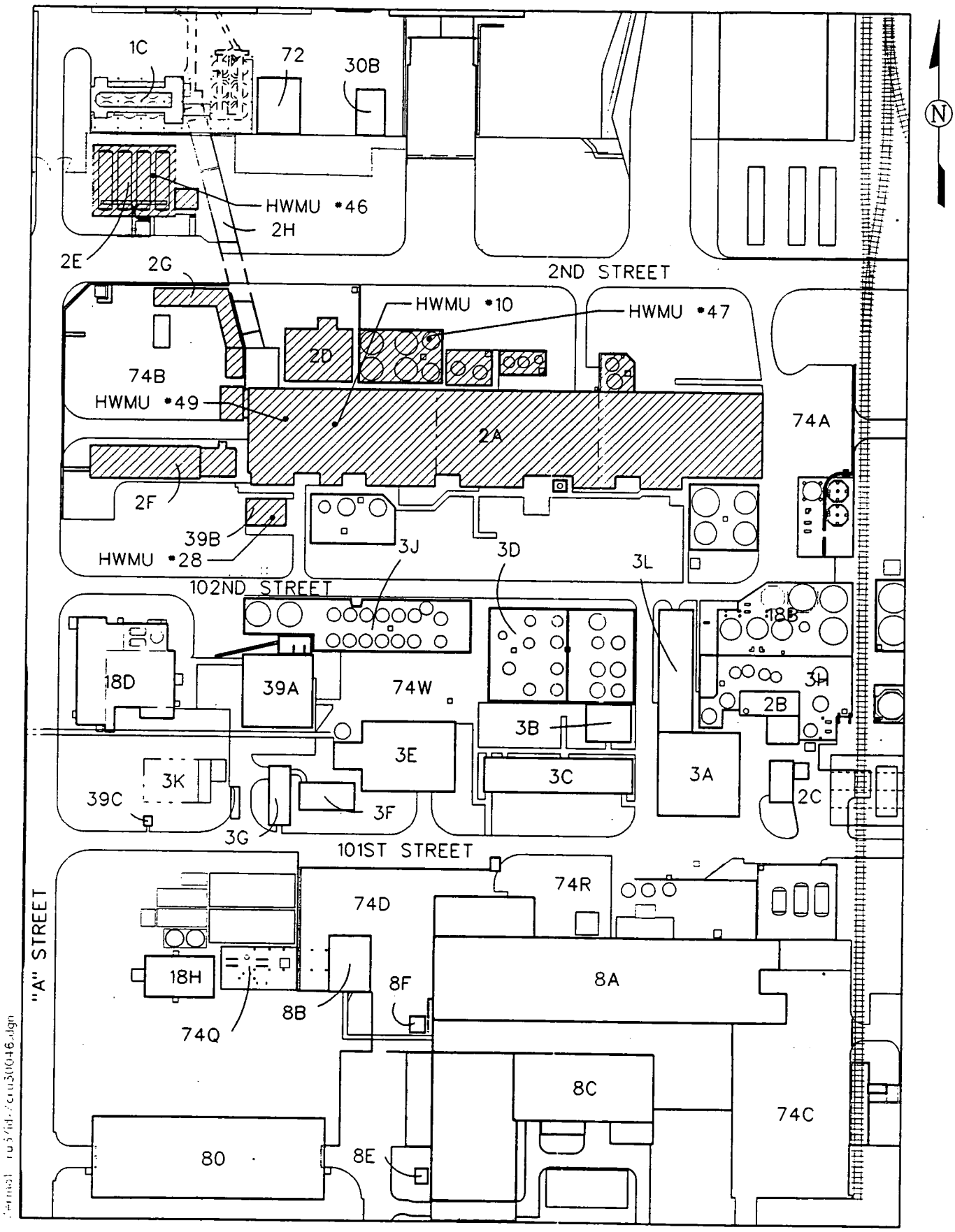

FIGURE C-10 Plant 2 Complex

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Basis for Assembly of the Plant 2 Complex
(Components: 2A, 2D, 2E, 2F, 2G, 39B)

- This complex is centered around one of the FEMP's main process facilities: Component 2A (Ore Refinery Plant).

- All of these components are located immediately adjacent to each other, thus making remediation controlled, safe, and resulting in few impacts on other areas of the site.

- Components 2A and 2E are interdependent in support of the UNH that will be processed as part of Removal No. 20. Since the other components are currently available for remediation, this complex may be remediated as a whole following completion of Removal No. 20.

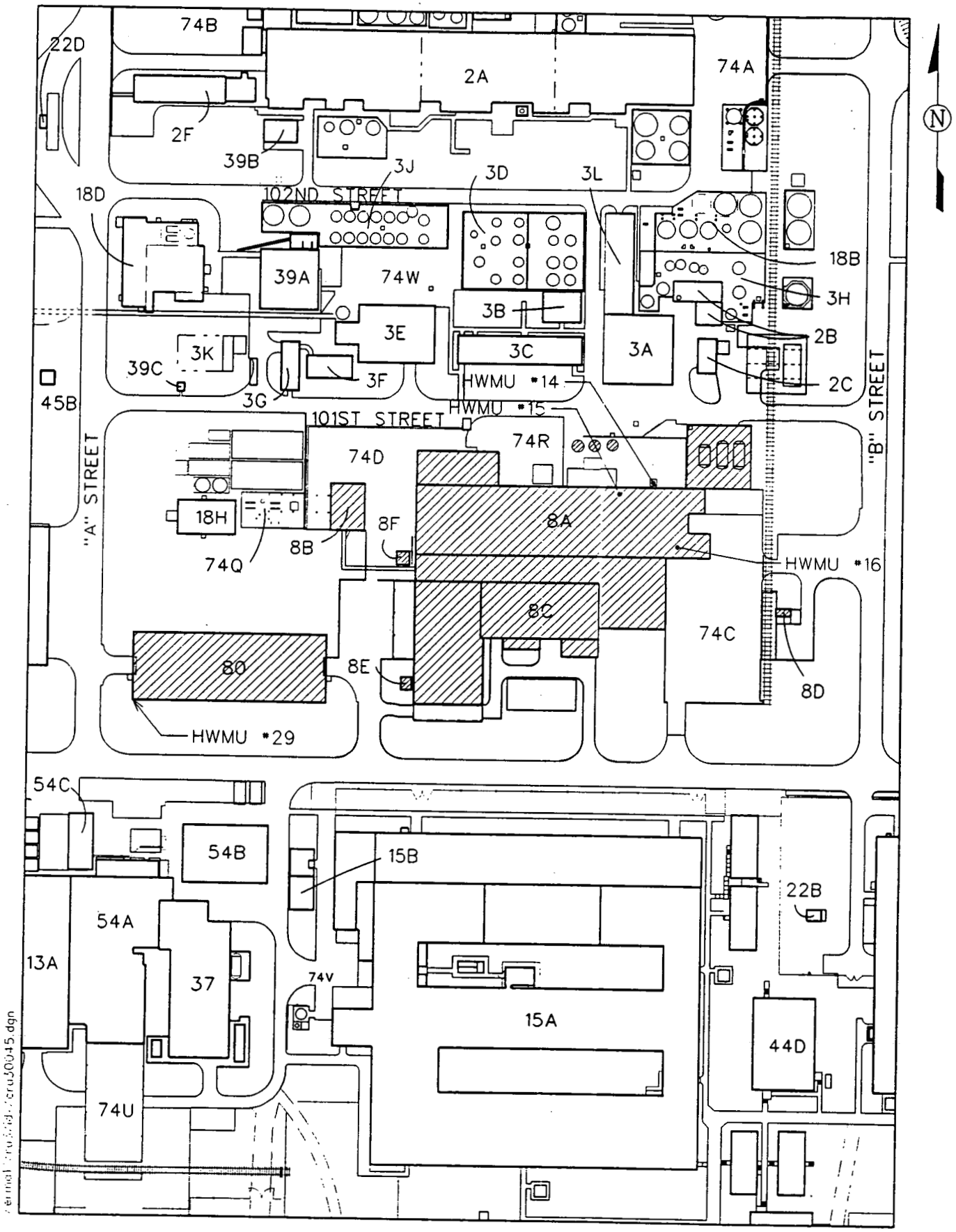

FIGURE C-11 Plant 8 Complex

Basis for Assembly of the Plant 8 Complex
(Components: 8A, 8B, 8C, 8D, 8E, 8F, 80)

- Components 8B, 8C, 8D, 8E, 8F, and 80 supported the function of the main process facility - Component 8A (Recovery Plant). Contaminants that exist in these components are expected to be similar.

- All components share the same section of a city block and are either physically connected or are immediately adjacent to each other.

- The remediation of this complex is tied to the completion of several functions by a few of these components as described in Table 4-1 of the PSR.

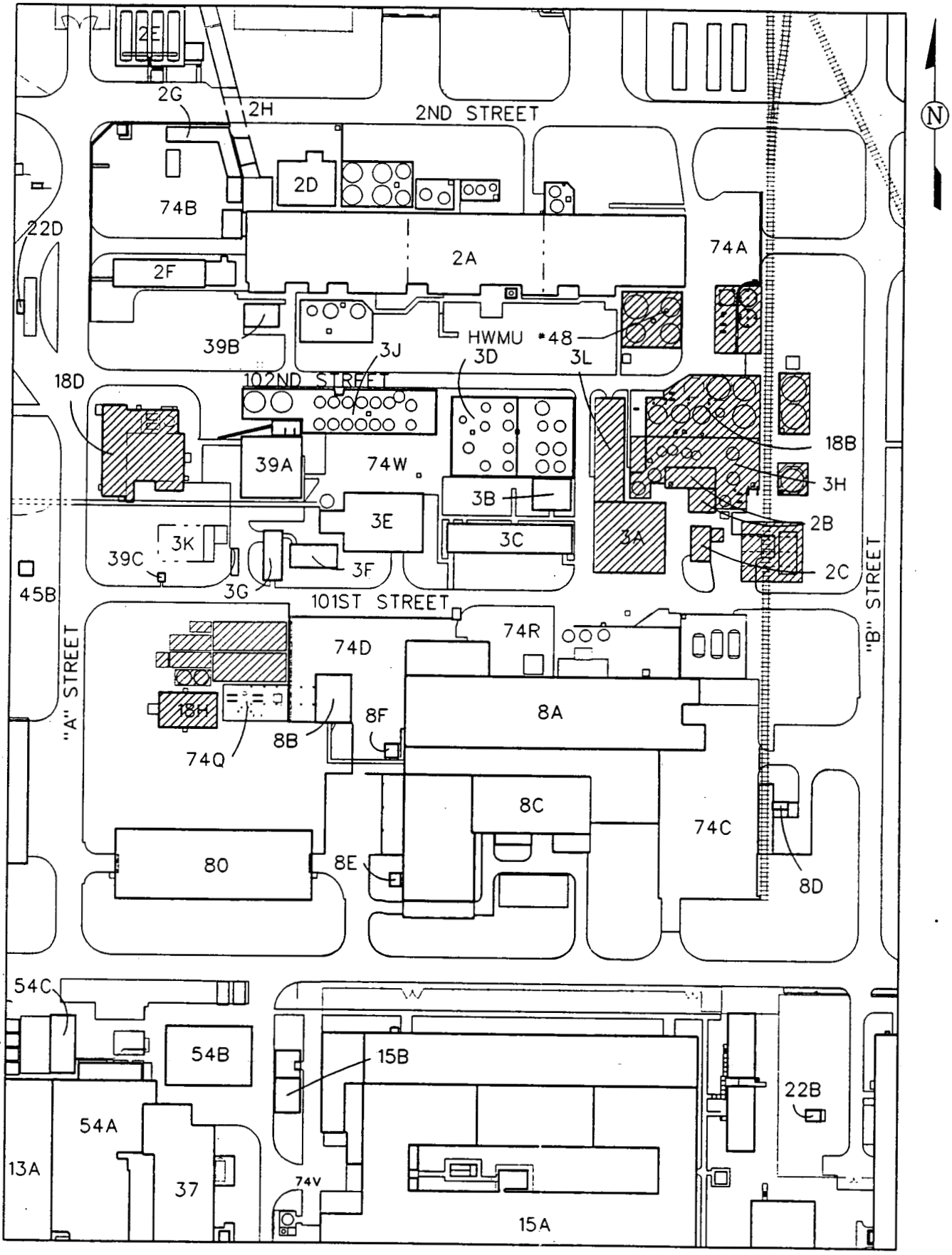

FIGURE C-12 General Sump Complex

Basis for Assembly of the General Sump Complex
(Components: 2B, 2C, 3A, 3H, 3L, 18B, 18D, 18H)

- All components are located within the same city block.
- Components 2B, 3H, 18B, and 18H currently support wastewater and former production area storm water processing. These functions will be incorporated into the new AWWT system, eliminating the future need for this system.
- Component 3A currently supports General Sump activities.
- Component 3L is the major electrical control center for the other components in the complex.
- Components 2C and 18D are either adjacent to or near the other components and are available for remediation.

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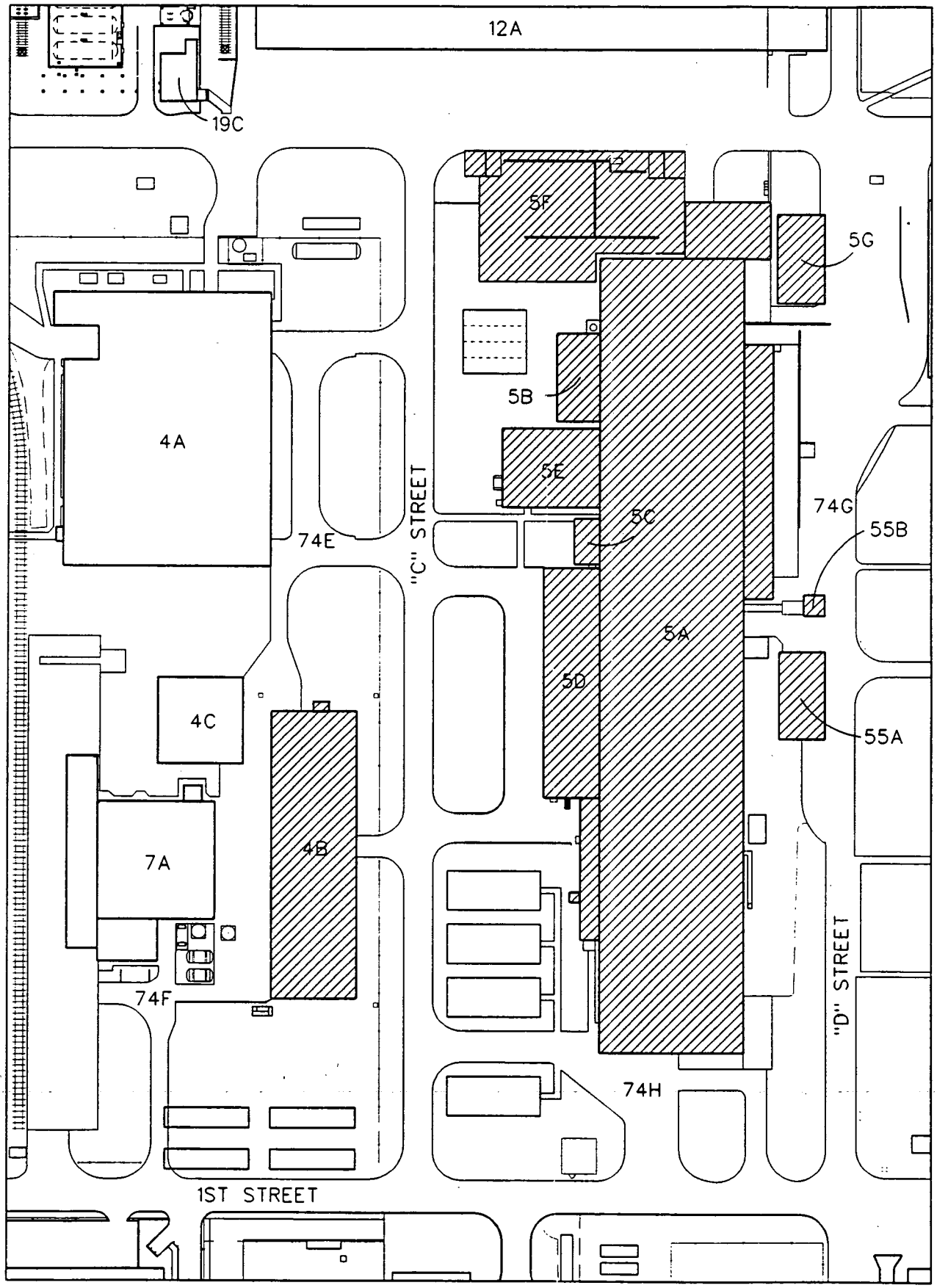

FIGURE C-13 Plant 5 Complex

Basis for Assembly of the Plant 5 Complex
(Components: 4B, 5A, 5B, 5C, 5D, 5E, 5F, 5G, 55A, 55B)

- Components 4B, 5B, 5C, 5D, 5E, 5F, 5G, 55A, 55B are centered around the main process facility - Component 5A (Plant 5 or Metals Production Plant). Plant 5 components (5A - 5G) could exhibit similar contamination concerns.

- All components share the same relative location. Except for Component 4B, which is located immediately to the west (across "C" Street), all other components are either connected to Component 5A or are immediately adjacent to it. The proximity of all components within or on the perimeter of one city block provides a functional construction zone relatively free of encumbrances.

- Since components 4B, 5A, 5F, and 5G are being used for storage of material/waste and make up the majority of the complex, the remediation of this complex will follow the completion of their warehousing function.

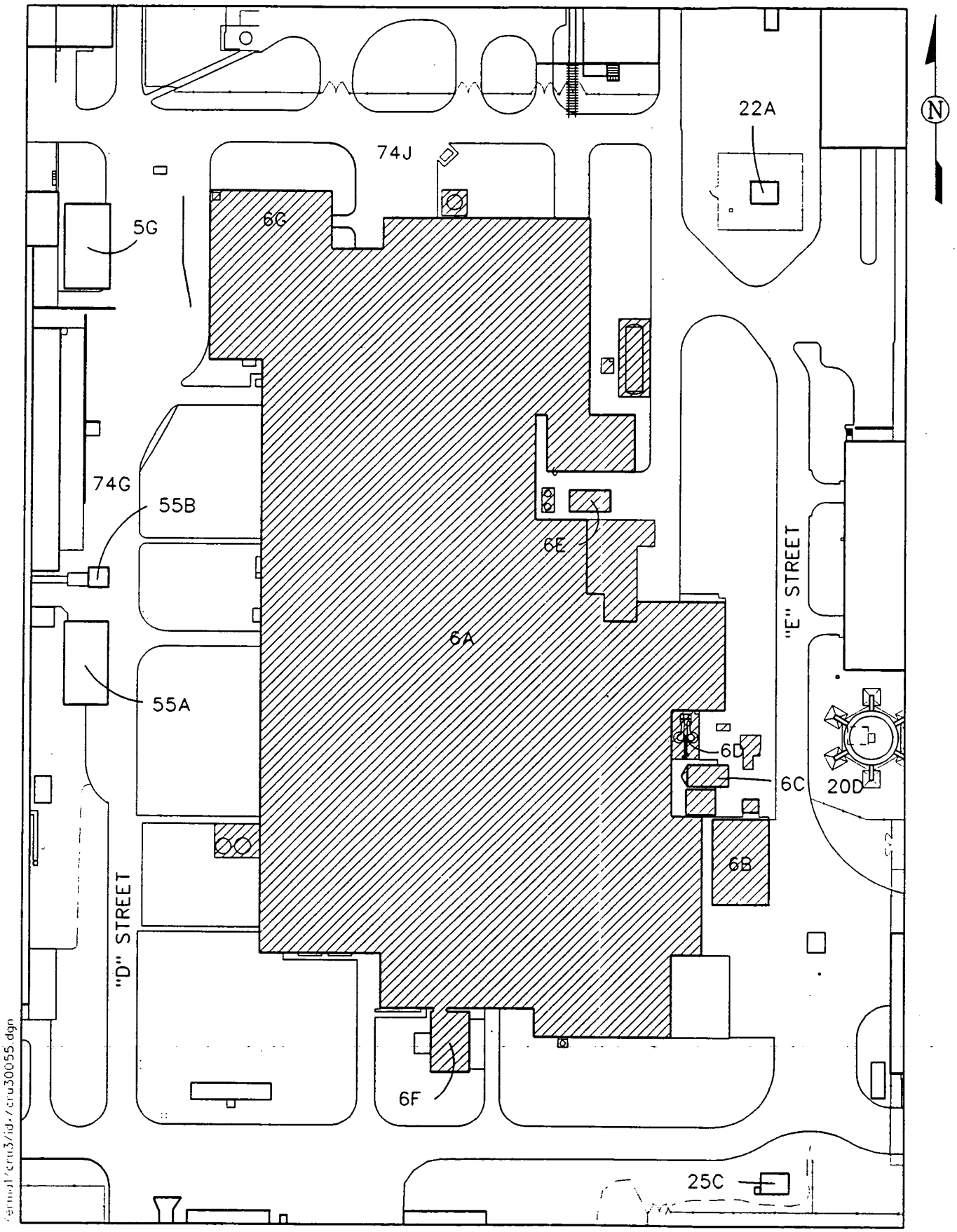

FIGURE C-14 Plant 6 Complex

Basis for Assembly of the Plant 6 Complex
(Components: 6A, 6B, 6C, 6D, 6E, 6F, 6G)

- Components 6B, 6C, 6D, 6E, 6F, and 6G supported the function of one of the FEMP's main process facilities - Component 6A (Plant 6 or Metals Fabrication Plant). Similar contamination concerns within these components exist.

- All components share the same city block and are either physically connected or are immediately adjacent to each other.

- The remediation of this complex is tied to the completion of the current warehousing function provided by Component 6A.

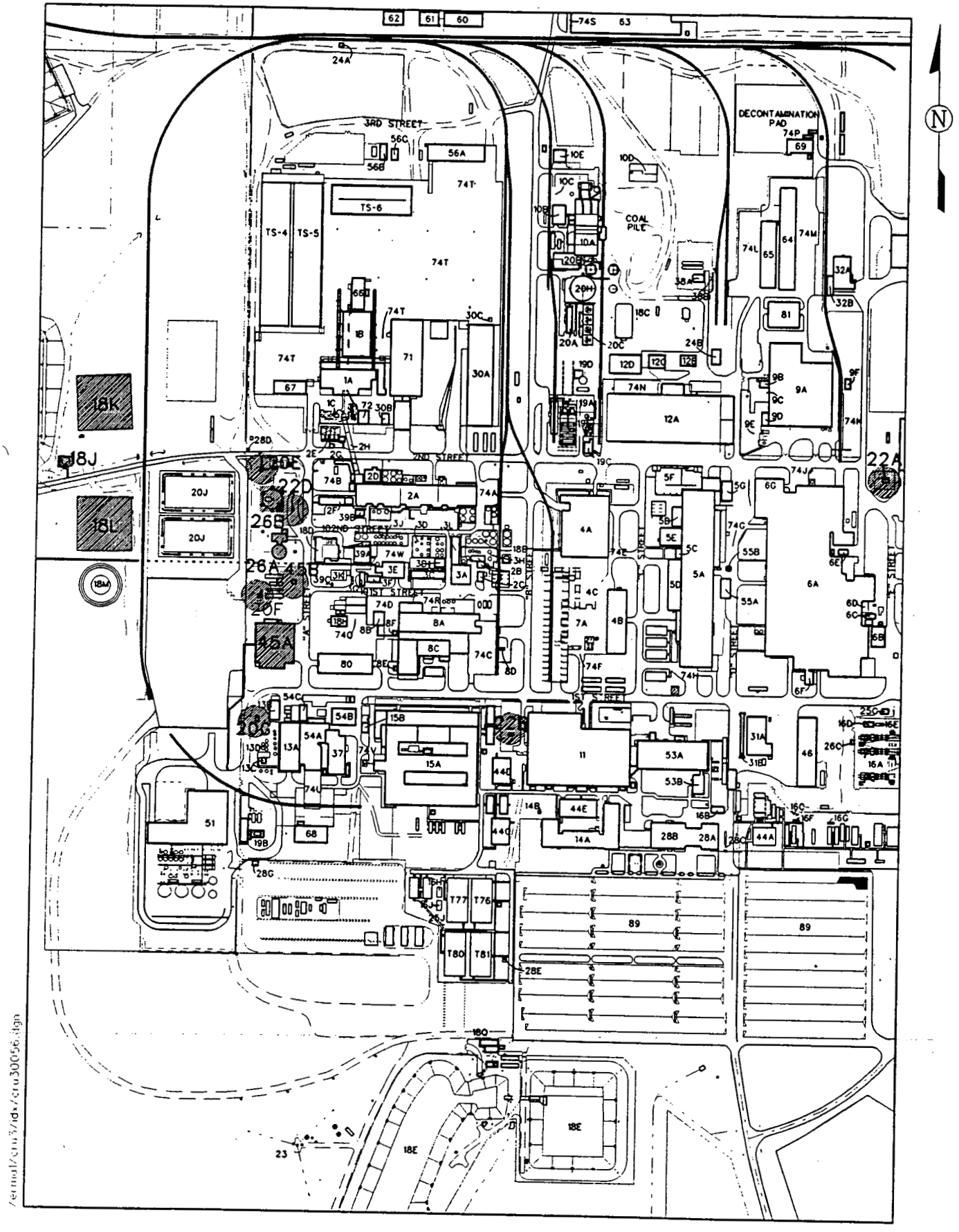

FIGURE C-15 Liquid Storage Complex

Basis for Assembly of the Liquid Storage Complex
(Components: 18J, 18K, 18L, 20E, 20F, 20G, 22A, 22B, 22D, 26A, 26B, 45A, 45B)

- Components 18J, 18K, 18L, 20E, 20F, 20G, 22D, 26A, 26B, 45A, and 45B share the same relative location at the site.
- Components 22A and 22B are similar in construction and relative function (and potential for similar contaminant make up) to Components 20E, 20F, and 20G.
- All components would be available for remediation either in the same general time frame.

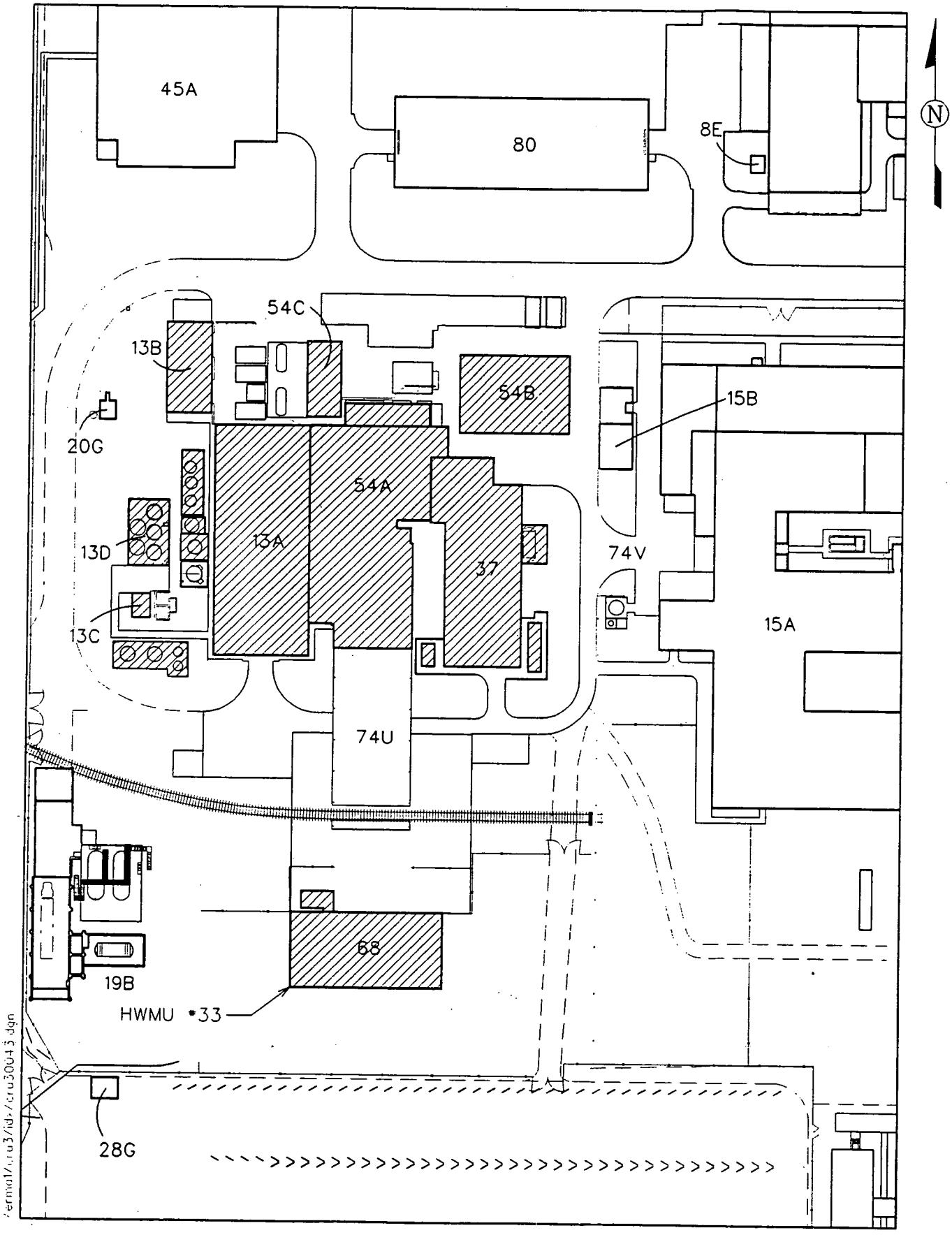

FIGURE C-16 Pilot Plant Complex

Basis for Assembly of the Pilot Plant Complex
(Components: 13A, 13B, 13C, 13D, 37, 54A, 54B, 54C, 68)

- This complex is centered around one of the major processing facilities at the site: Component 13A (Pilot Plant); one section of a city block is occupied by these components which allows for a safe, controlled construction zone.

- Components 13A, 54A, and 37 are connected (i.e., share common walls).

- Following removal of thorium nitrate in Component 13D, all components will be available for remediation.

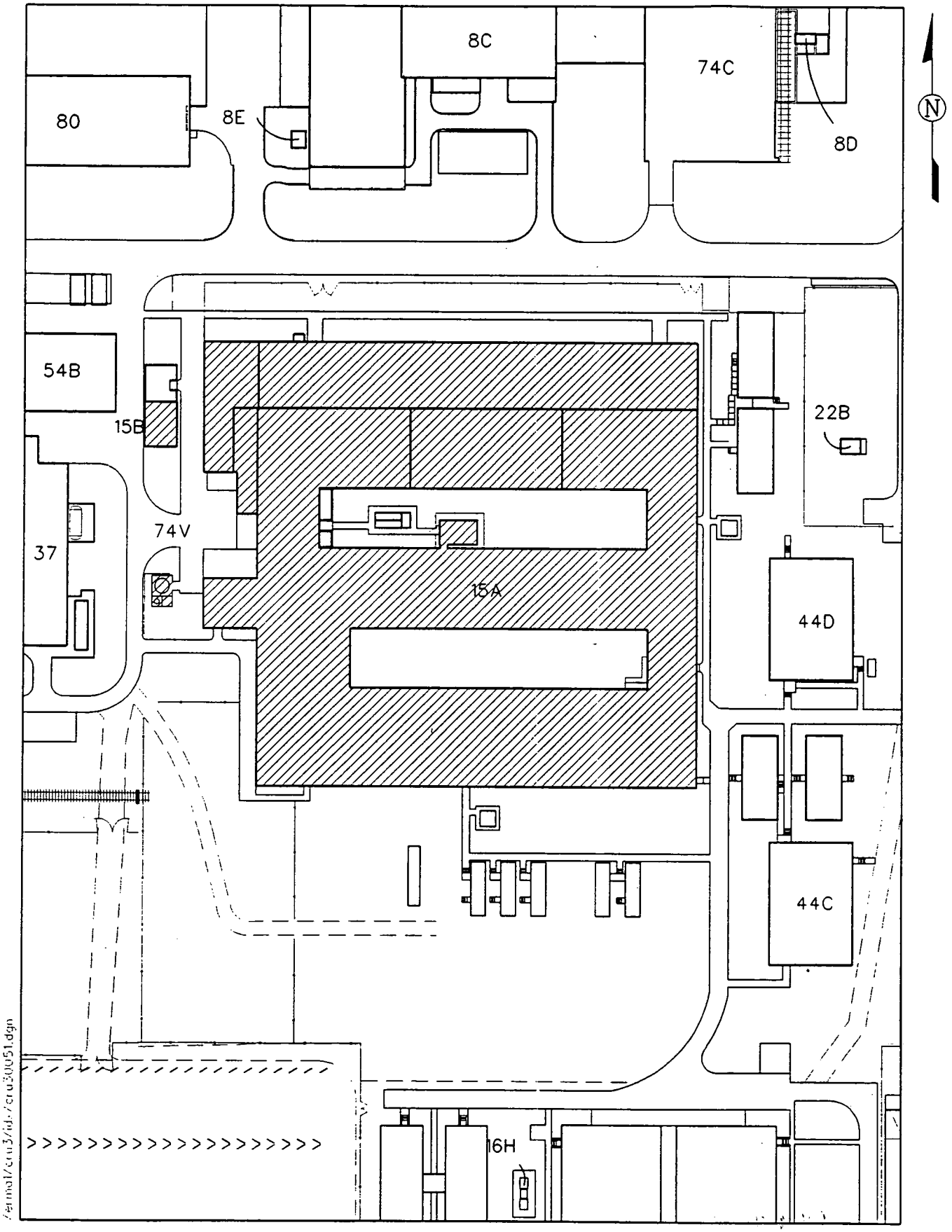

FIGURE C-17 Laboratory Complex

Basis for Assembly of the Laboratory Complex
(Components: 15A, 15B)

- Components 15A and 15B share common walls, occupy an entire section of a city block, and are interdependent in support of the analytical work performed at the site.

- Both components are currently being used to support on-site analytical work, but will be available for remediation as the volume of routine analytical work is reduced.

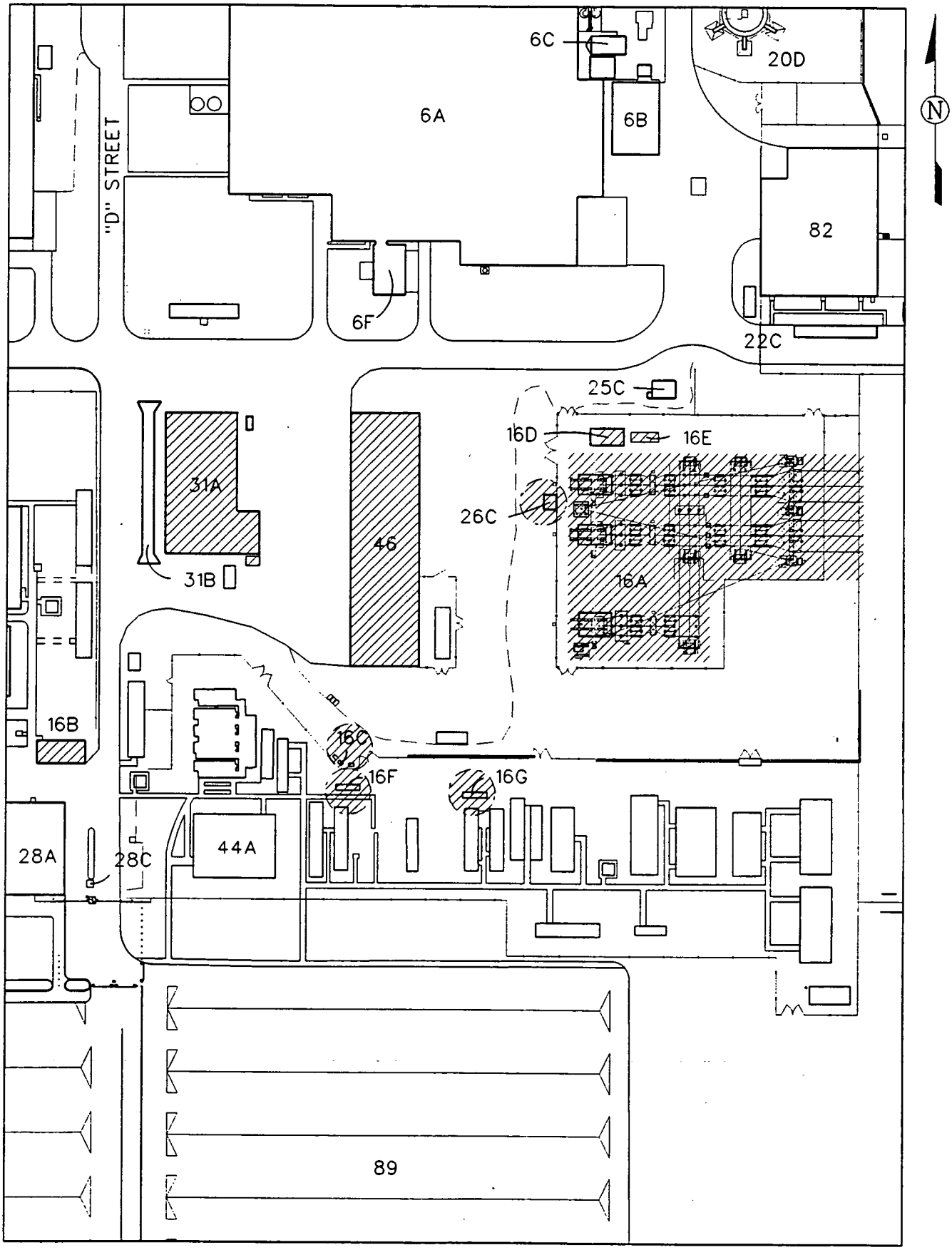

FIGURE C-18 Electrical Station Complex

Basis for Assembly of the Electrical Station Complex
(Components: 16A, 16B, 16C, 16D, 16E, 16F, 16G, 26C, 31A, 46)

- The electrical components (16A through 16G) are interdependent of each other and are located in the same general vicinity in the southeast corner of the former Production Area.

- Components 31A and 46 are located close to the electrical components and would not be logical to exclude them from the complex.

- Although all of the electrical components are currently needed for site remedial operations, they will become available for remediation at the same time.

- Electrical components are structurally similar, requiring similar expertise to remediate.

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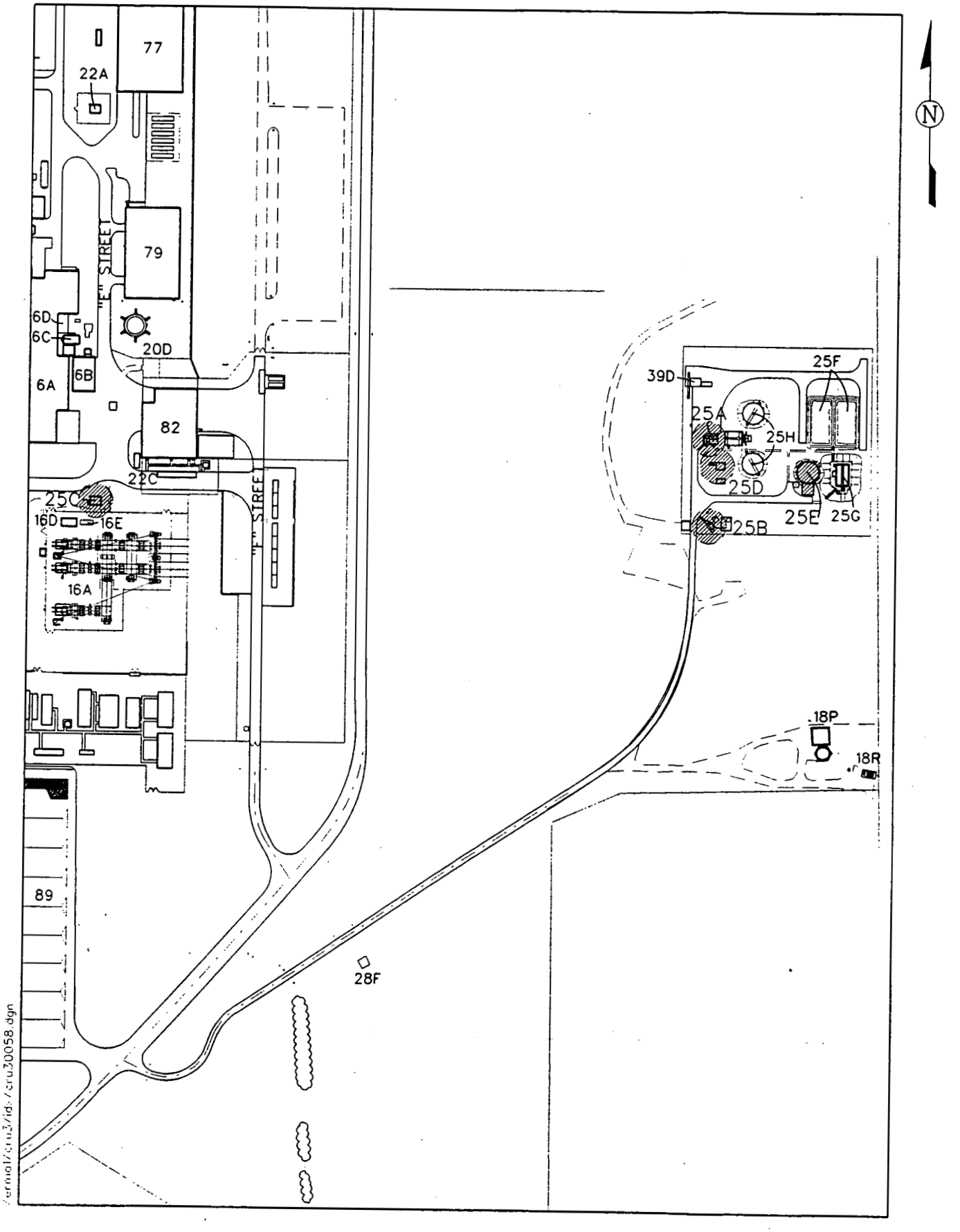


FIGURE C-19 Sewage Treatment Plant Complex

Basis for Assembly of the Sewage Treatment Plant Complex
(Components: 25A, 25B, 25C, 25D, 25E)

- All of these components are interdependent in support of the sewage treatment function at the FEMP.
- Components 25A, 25B, 25D, and 25E share the same relative area located in a controlled area outside of the former Production Area on the east side of the FEMP.
- Although Component 25C (Sewage Lift Station) is located just inside the former Production Area, this component is part of the sewage treatment system, is relatively simple to remediate, and will not impact surrounding components.
- These components will be available for remediation once their function is replaced.

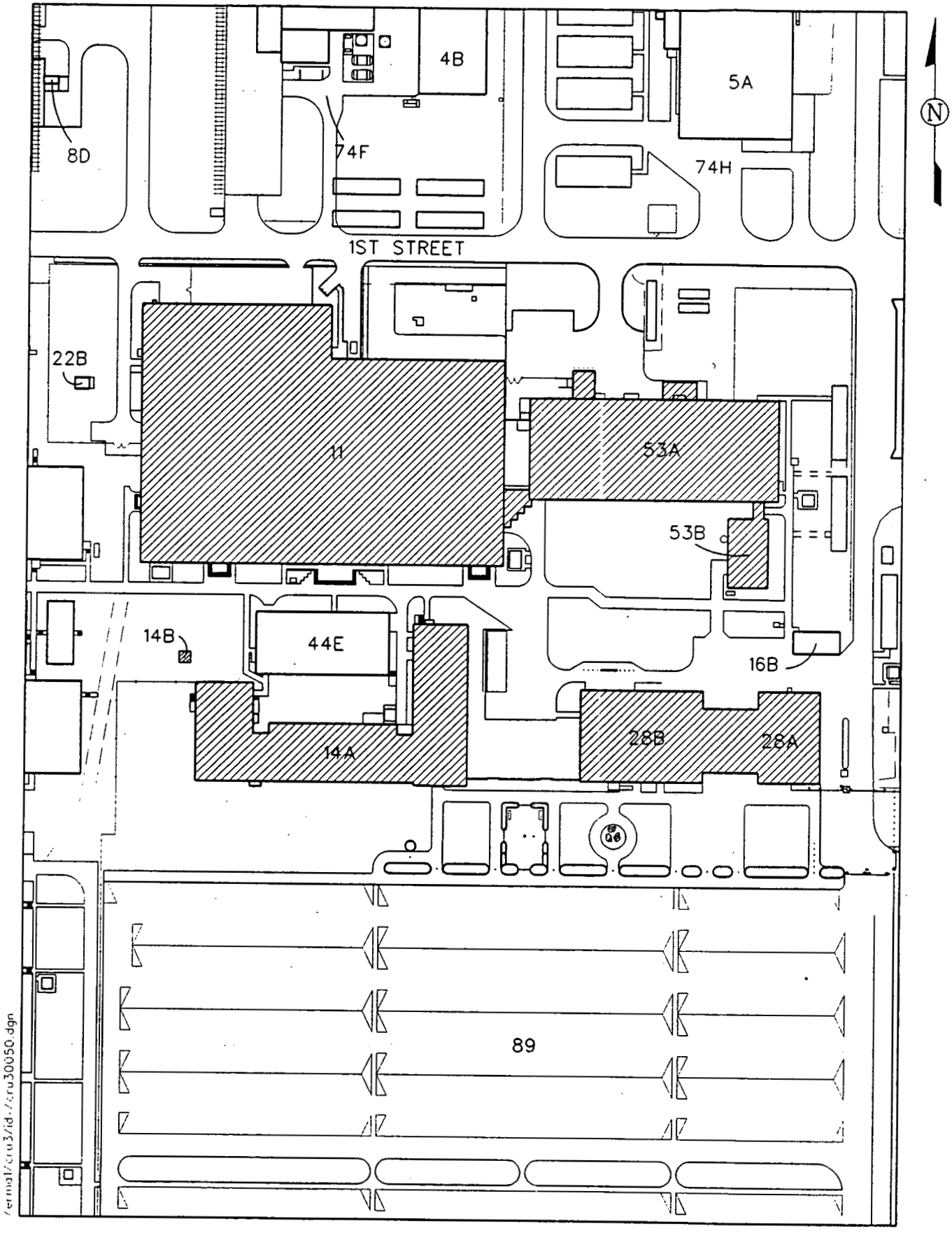
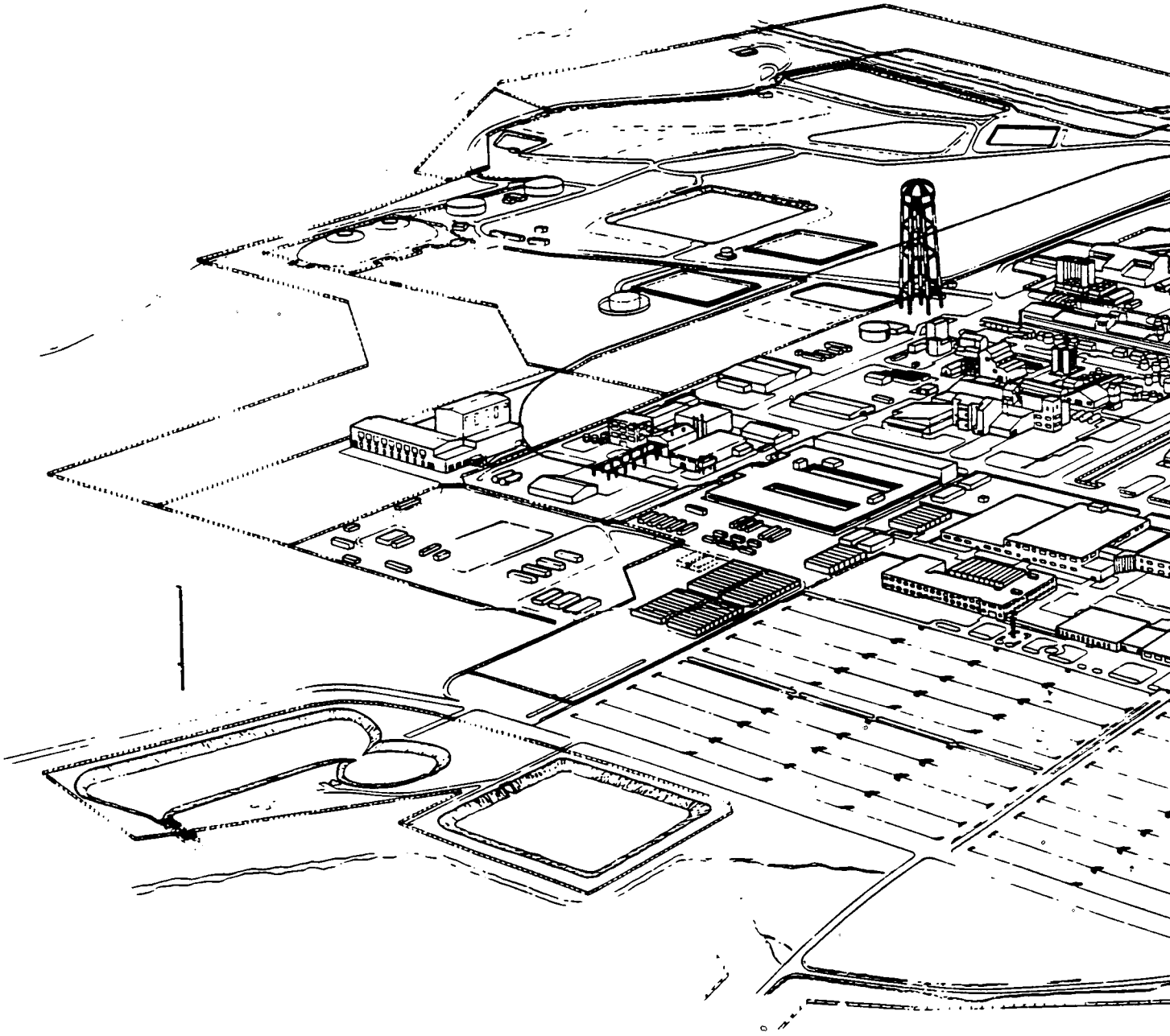


FIGURE C-20 Administration Complex

Basis for Assembly of the Administration Complex
(Components: 11, 14A, 14B, 28A, 28B, 53A, 53B)

- All components have future use as key support facilities during FEMP remediation and will be remediated after completion of other complexes.
- All components are located in close proximity to each other.